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Smash Government Ownership Plan

Referendum Indicates Administration's Pet Policy Has No Friends
Among Business Men—Mail Subventions Overwhelmingly Indorsed

How the Chamber Voted on Shipping Question

Do you favor the government undertaking the purchase, construction, or charter of vessels for mercantile purposes, together with the operation of such vessels? In favor, 82; opposed, 698.

Do you favor ownership of merchant vessels by the government, but with operation by private parties under leases? In favor, 54; opposed, 711.

Do you favor subsidies from the government suffi-

cient to offset the difference in cost between operation of vessels under the American flag and operation in the same deep-sea trades under foreign flags? In favor, 558; opposed, 186.

Do you favor subventions from the government to establish regular mail and freight lines under the American flag to countries in which the commercial interests of the United States are important, and to American dependencies? In favor, 718; opposed, 48.

THE ENEMIES of an American merchant marine have experienced a tremendous setback as a result of the referendum of the Chamber of Commerce of the United States on the shipping question. By an overwhelming vote of 698 to 82, the constituent members of the National Chamber, located all over the country, rejected the policy of government ownership of ships. By an equally decisive figure, 558 to 186, adequate subsidies for our merchant marine were indorsed. Also by the comparative slim majority of 422 to 314 the referendum indorses the suggestion of the National Chamber's special committee on merchant marine for the creation of a government corporation with \$30,000,000 capital to handle and guarantee securities of American shipping companies. Various other proposals for lightening the burdens on American ships were approved.

This referendum forms one of the most significant public opinions on the shipping subject in the last 10 years. It represents the consolidated, mature, experienced judgment of America's leading business men expressed through their local Chambers of Commerce and commercial organizations. It is evident that the American people are rapidly awakening to the needs of our sea-faring commerce.

Of particular importance is the vote against the government ownership plan, which was rejected

both as to lines owned and operated by the government and to lines owned but leased to private operators. The administration used every effort to force the enactment of the ship purchase bill during the last session of congress. The recent Pan-American financial conference seemed to strengthen the official desire to obtain the enactment of the measure, and Secretary McAdoo, of the treasury department, in his farewell letter to the Latin-American delegates, announced that the bill would probably be re-introduced next December.

This letter was written before the chamber's referendum vote was announced and that the latter has taken considerable wind out of the secretary's sails is evidenced by the specious reasoning to which he was forced to resort in explanation of the overwhelming rejection of the administration's pet shipping policy. McAdoo took the position that the referendum was not a test of sentiment on the ship purchase bill because the latter did not provide for direct government ownership, but for the government control of the stock of a private corporation. Ordinary people, however, can distinguish no difference between this scheme and direct government ownership.

The administration probably will insist on re-introducing the ship purchase bill next winter, but its chances of success appear to be very slim.

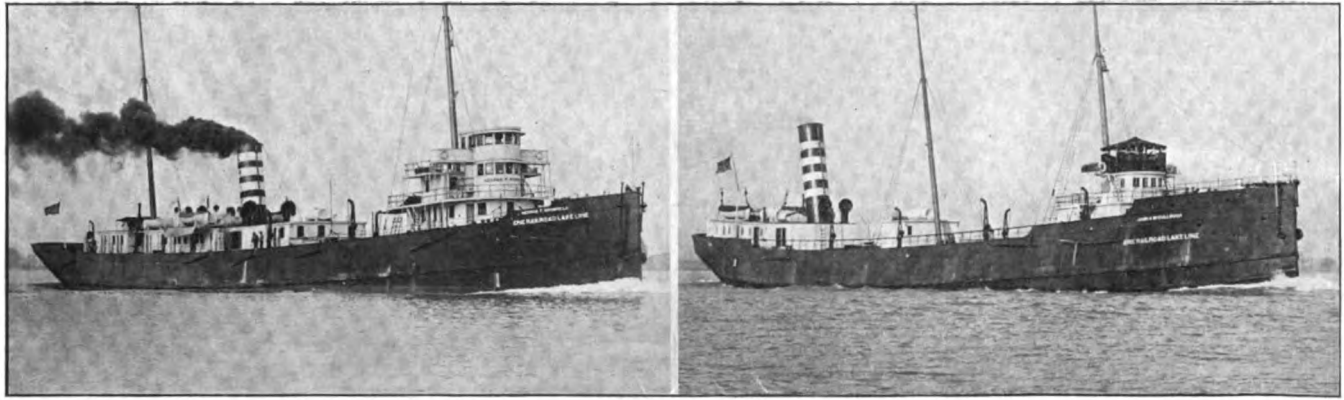


Fig. 1—George F. Brownell and John G. McCullough—Two of the Erie Lake Line Boats Sold to Atlantic Coast Parties

Many Lake Freighters Go to Coast

Erie and Other Railroads Sell Boats Now Engaged in Package Freight Trade—Commission's Ruling May Demoralize Traffic

IT IS evident that the package freight business on the Great Lakes is to undergo a demoralizing revolution as a result of the decision of the interstate commerce commission compelling railroads in various parts of the country to dispose of their steamship holdings. The details of the commission's decision were covered fully in the July issue of *The Marine Review*. Since that time, steps have been taken to transfer a large number of the package freighters on the Great Lakes to the Atlantic coast, where they will engage in the coastwise and overseas trade.

There is a tremendous demand for steamship tonnage on the coast at the present time, due largely to the destruction and withdrawal of German, French and English ships on account of the war. Several of the railroad lines affected by the commerce commission's decision, therefore, have decided to take advantage of an opportune moment and dispose of their marine holdings without waiting for the final disposition of the case. Some of the strongest of the Great Lakes railroad owned package freight lines, including the Anchor Line, owned by the Pennsylvania railroad,

have not yet announced what they intend to do with all their boats and the prospect of a fight against the commission's order has not been totally dissipated, although it now appears less likely that such action will be taken than was the case a month ago.

Half of the Boats Will be Sold

At the present time, it seems probable that about half of the package freighters on the Great Lakes will be transferred to salt water and that the remainder will be organized into a single company, which will endeavor to carry on the business free from railroad control. The package freight lines on the Great Lakes, however, never can operate successfully without intimate co-operation with the railroads and it

remains to be seen just how far the interstate commerce commission will permit any new company to go in this respect. It also is evident, from the large number of boats which it now appears will be withdrawn from the lakes, that the package freight industry will be greatly curtailed, if not permanently stultified, beginning with next season. The boats which will remain will not have sufficient capacity to take care of the volume of business that has been moving even in lean years like 1914. How this situation can be made to square with an enlightened public policy, only the interstate commerce commission can answer.

It now is definitely known that four of the Erie Railroad Lake Line steamers have been sold and will be transferred to the Atlantic coast. Also it is practically assured that four of the vessels in the Western Transit company's fleet will be disposed of in a similar manner. In addition, negotiations are known to be under way for the sale of four boats belonging to the Erie & Western Transportation Co., together with nine vessels owned by the Mutual Transit Co. and three steamers which

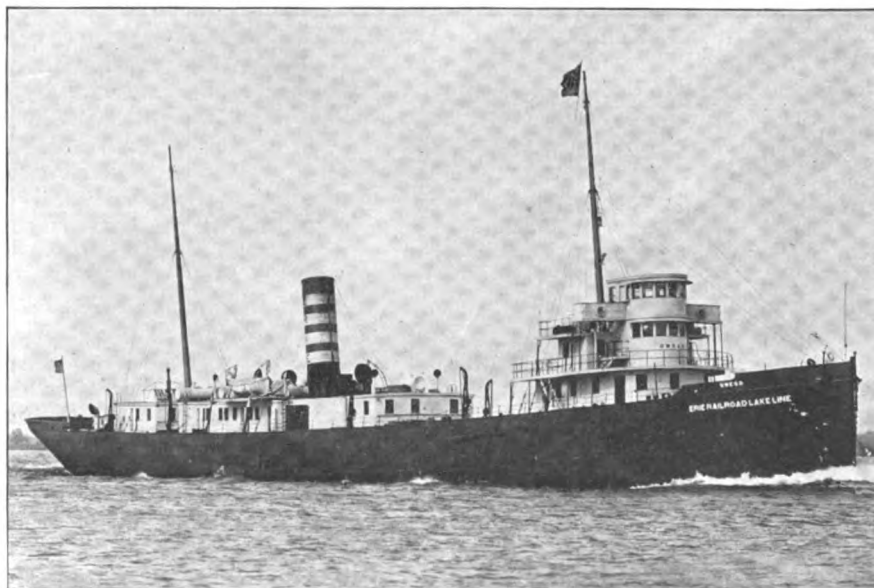


FIG. 2—OWEGO—ONE OF THE ERIE BOATS THAT WILL BE CUT IN TWO

are owned by the Lehigh Valley. The four Erie boats, for which definite transfer arrangements already have been made, include OWEGO, GEO. F. BROWNELL, GRANVILLE A. RICHARDSON and JOHN G. McCULLOUGH. These vessels, it is understood, have been purchased by an eastern syndicate headed by Wm. G. Davidson, president of the Staten Island Ship Building Co., New York. It has been announced that two of the vessels will engage in the coast-wise trade and two in the transatlantic trade. OWEGO is 325 feet long, 41 feet beam, and 14 feet in depth. She has a registered gross tonnage of 2,611 and a net tonnage of 1,776. Government records indicate that she carries a crew of 20 men and is equipped with an engine of 1,000 indicated horsepower. She was built in 1888. GEO. F. BROWNELL is a duplicate of OWEGO, although her tonnage measurements, according

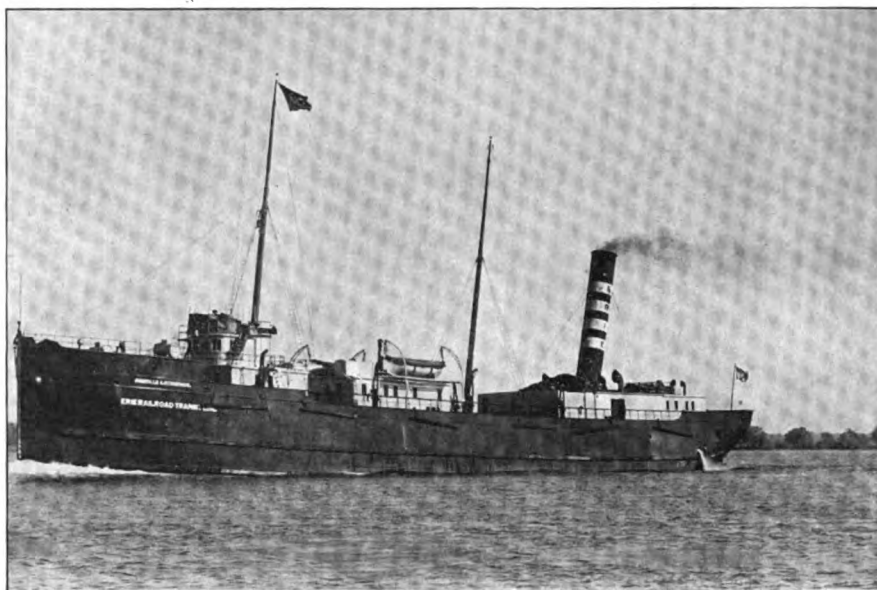


FIG. 4—GRANVILLE A. RICHARDSON CAN GO THROUGH WELLAND CANAL WITHOUT ALTERATIONS

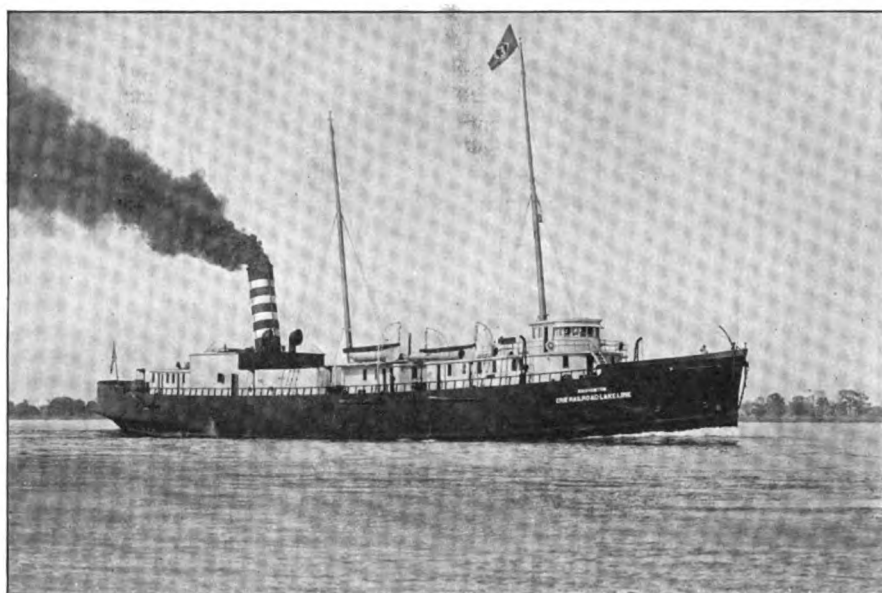


FIG. 3—BINGHAMTON—ANOTHER ERIE BOAT MENTIONED IN NEGOTIATIONS

to government records, are slightly different, namely 2,615 gross and 1,778 net. GRANVILLE A. RICHARDSON, which was built in 1893, is 256 feet long, 41 feet beam, and 28 feet in depth. Her gross and net tonnages are 2,237 and 1,790, respectively. This vessel carries a crew of 24 men and is equipped with a 1,000 indicated horsepower engine. JOHN G. McCULLOUGH, built in 1890, measures 1,895 gross and 1,604 net tons. She is 255 feet long, 40 feet beam and 21 feet in depth. Like the RICHARDSON, she carries a crew of 24 men and is equipped with a 1,000 indicated horsepower engine.

Inasmuch as the locks in the Welland canal are 270 feet in length, it is evident that the steamers RICHARDSON and McCULLOUGH can be transferred to the Atlantic coast without alterations, except for salt water equipment in the

engine rooms. OWEGO and GEO. F. BROWNELL, however, will have to be cut in two in Buffalo and put together again on the St. Lawrence river after the two sections have been locked through the Canadian canals. A contract for cutting these boats in two already has been placed with the American Shipbuilding Co. and the work will be done at the yards of the Buffalo Dry Dock Co.

If it were not necessary to cut a great many of the Great Lakes package freighters in two in order to get them through the Canadian canals, there is little doubt but that a much larger number of sales would have been made to coast parties before this time. The expense and delay involved in cutting the boats in two and putting them together again operates as a serious handicap in negotiating for their sale for

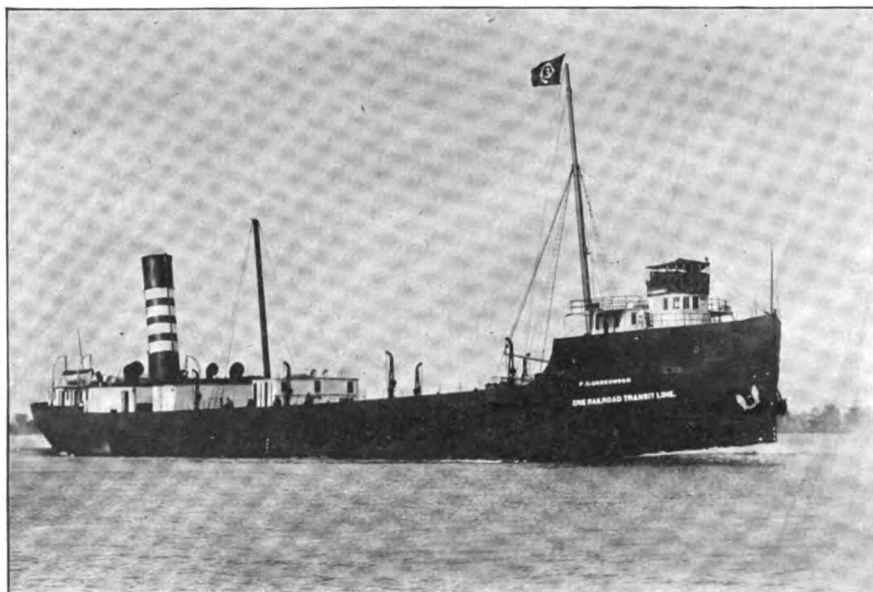


FIG. 5—F. D. UNDERWOOD—NAMED AFTER PRESIDENT OF ERIE RAILROAD CO.

service on salt water. The expense varies from \$25,000 to \$35,000 per boat, including the work necessary to fit condensers, etc., for handling salt water. This operation, although by no means unprecedented on the Great Lakes, is always interesting. Very frequently, the bulkheads are built in the hulls before the boats are dry docked and cut apart.

With regard to the sale of the Western Transit Co.'s fleet, controlled by the New York Central, Edwin T. Douglass, general manager, is quoted in a Buffalo paper as follows: "The Western Transit Co. is now having plans and specifications prepared for cutting the steamers CHICAGO, MILWAUKEE, MOHAWK and UTICA, four of our fleet of lake boats, in two so that they may be taken through the Welland canal and sent to the Atlantic coast at New York. It is true, therefore, that negotiations are pending for the sale of vessels of our line and there is evidence that the boats of other local lines are being similarly sought. These boats are all in active service today on the lakes and if they are sold to go to the coast it will be necessary to take them out of lake service early, presumably the latter part of August or early in September so that they may be cut where necessary and alterations made in order to put

the boats through the Welland canal." The vessels of the Anchor Line fleet which probably will be sold include CODORUS, MAHONING, SCHUYLKILL, and SUSQUEHANNA. The Mutual Transit boats mentioned in the pending negotiations include NORTHERN KING, NORTHERN QUEEN, NORTHERN WAVE, NORTHERN LIGHT, NORTH WIND, MINNEAPOLIS, ST. PAUL, HURON and WM. CASTLE RHODES. It is also practically assured that the Lehigh Valley boats BETHLEHEM, SARANAC, SENECA and TUSCARORA have been sold.

Canal Details

On account of the important part which the Canadian canals play in the sale of railroad owned package freighters on the Great Lakes, the following particulars may be of interest. The Welland canal connects Lake Erie and Lake Ontario, and overcomes the rapids of the Niagara river and Niagara Falls. It is $26\frac{3}{4}$ miles in length with a total lift of $326\frac{3}{4}$ feet. There are 25 locks, each 270 feet long and 45 feet wide with 14 feet of water on the sills. Besides the regular lift locks, there are two pairs of guard gates and one guard lock. There are no tolls of any kind. Vessels must not run more than four miles an hour through the canal reaches, except on the summit level

where a somewhat greater speed is permitted. The original Welland canal had 40 wooden locks and was not cut through to Lake Erie. This canal led into the Welland river. From there vessels passed into the Niagara river just below Grand Island, and came up the river to Lake Erie. The present Welland canal is the third one built. The Lake Ontario entrance is at Port Dalhousie and the Lake Erie entrance is at Port Colborne.

A new and larger canal is now under construction, known as the Welland Ship canal. Its length will be 25 miles. The Lake Ontario entrance will be at Port Weller, about three miles east of Port Dalhousie. It will join the present canal at Allansburg and will follow the line of the present canal having Port Colborne also as its Lake Erie entrance. There will be seven lift locks, each $46\frac{1}{2}$ feet lift. They will accommodate vessels 800 feet long, 80 feet wide, drawing 30 feet of water. It is evident that upon the completion of this canal it will be possible to bring any but the largest ocean steamships into the Great Lakes. It is estimated that the canal will cost about \$50,000,000. Unfortunately construction work has been seriously curtailed since the outbreak of the European war a year ago.

Pacific Mail to Go Out of Business

THE Pacific Mail Steamship Co., incorporated in New York in 1848, it is stated will dissolve before the end of the year. The reason assigned by the company is the cumulative oppression of governmental legislation.

According to an announcement by the Pacific Mail, that company's last ship will sail from San Francisco for far eastern ports on Nov. 2. Thereafter all of the company's ships will be for sale in the open market, and the gradual dissolution of the company will follow.

When the seamen's act becomes operative, according to the company's officials, it will be useless to try to compete any longer with Japanese government subsidized ship companies operating on the Pacific. The company has based its conclusions on the reports of experts. These reports, calculating the increased cost to the Pacific Mail of manning its transpacific and coastwise steamers so as to comply with the seamen's act, show that it would be ruinous to continue operation.

The Pacific Mail Steamship Co. is a \$20,000,000 corporation, and control of the stock lies with the Southern Pacific railway, which has shaped the steamship company's policies. While

the volume of business has been increasing within the last decade, the company had considerable deficits in four years out of the last six. The last dividend paid was in 1899, when 3 per cent was declared. It had been hoped that the completion of the Panama canal would improve conditions, but the exclusion of the Southern Pacific from the canal by the Panama canal act wiped out that possibility.

The steamship company operates 13 big ships. Five of these ships are used in the transpacific trade, touching Philippine and Asiatic ports. The others are used in the coastwise trade, touching South and Central American ports. The 13 ships have a book value of \$11,298,000.

All of the steamships operating in the transpacific trade are officered by citizens of the respective countries whose flags they fly. The crews, however, consist, for the greater part, of Chinese and East Indians. Two Japanese lines touching American ports make exception to these rules by using only Japanese sailors. Another Japanese line uses Japanese and Chinese.

According to the experts employed by the Pacific Mail Steamship Co., the cost of its service, were it to comply

with the provisions of the new act, would include an additional expenditure of \$608,271 a year for wages and \$193,771 a year for feeding crews. This would be a total of \$802,042.

"It stands to reason that this added expense could not be borne," said an official of the steamship company recently. "Prior to 1913 we had an annual deficit for a number of years. In 1913 the surplus was \$20,000, and in 1914 it was \$300,000. It is apparent that our company cannot meet the competition of the Japanese lines."

The company has received a number of proposals for its ships, but the bidders have not been made known. It was stated, however, that Japanese and Chinese interests had not been among the bidders. There is a shortage of ships in the market, and it is probable that the purchase price of the 13 vessels will be in excess of the book value.

Compared with the operations of the previous year, the Pacific Mail in 1915 had an increase of operating revenues of \$177,423, while operating expenses decreased \$294. After accounting for depreciation and taxes, the year's results showed a gain in total operating income of \$187,978, or 23.1 per cent. Total net income was \$888,491, compared with \$710,840 in 1914.

Importance of Merchantmen in War

How This Class of Ships is Serving the Hostile Nations—Successful
Prosecution of War Rests Largely on Adequate Merchant Marine

By Captain George S. Laing

THE IMPORTANCE of an adequate merchant fleet to the life of any nation has been emphasized so frequently, that in peaceful times the full force of the statement is sometimes lost. The European war, however, furnishes another clear-cut and forcible argument that commands attention. The need of merchant ships, as demonstrated by the war, while general in application, is of special significance to the

existed between the two national fleets. This was the Royal naval reserve. A few years ago, there was danger of this reserve being abandoned. Such a condition can only be likened to carrying a massive anchor with no chain in the locker. Without its naval reserve, the efficiency of the British fleet would have been seriously curtailed.

The tacking, wearing and stern-board maneuvers of the fleets a cen-

from its native country, is a cog in the wheel, and a weighty asset to the nation involved.

If the export trade of a country is in process of development, that nation is safest which has its own ships to carry the material. The war has shown that further security is insured if imports also can be so handled. With its extensive coast and lack of an over-seas fleet the United States is at present seriously handicapped.

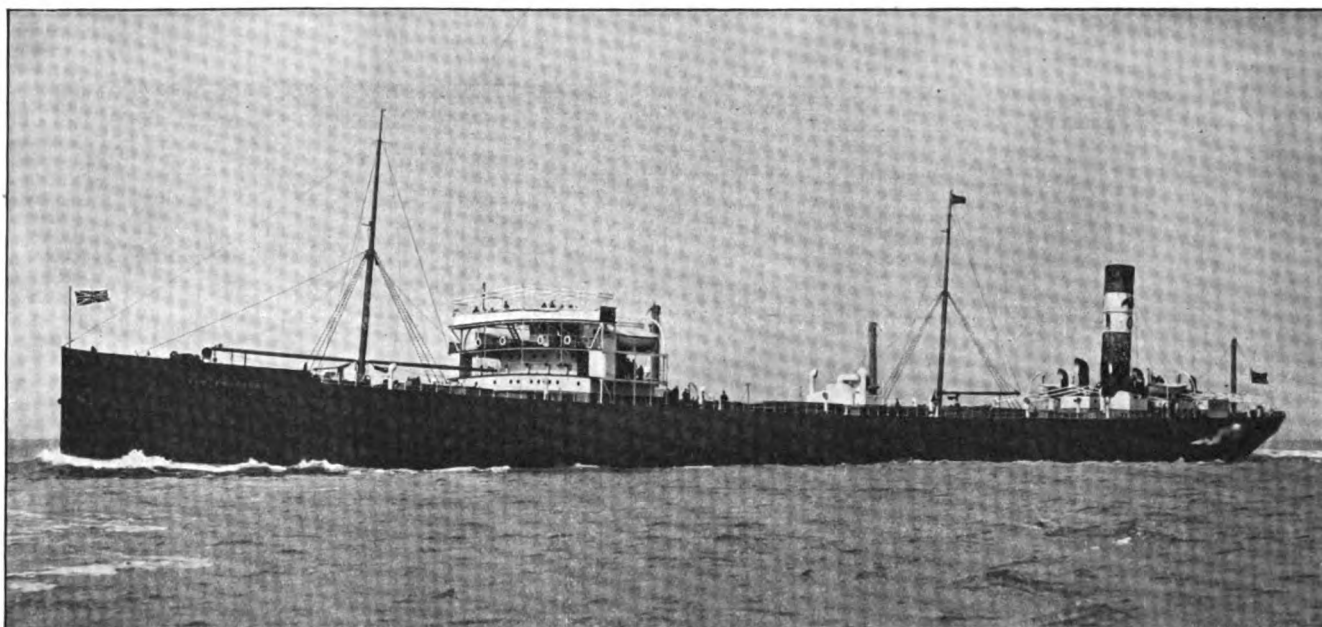


FIG. 1—OIL TANKER CARRYING FUEL FOR WARSHIPS

United States in its position as the one world power with a large seacoast and but few merchant vessels.

Prior to the war, there was a wide gap between war craft and merchant vessels. Many naval experts considered each fleet as an independent unit. The fallacy of this belief is now clear and the close connection between the two fleets was never better understood.

As I am purely a merchant sailor, this article shows what merchant ships are doing in the war. It will demonstrate to the reader that a nation, such as the United States, with large, magnificent seaboards, must shortly possess a merchant fleet as well as warships. The one is absolutely useless without the other. The British empire affords an example of this. A weak link has always

tury ago, were marvels of seamanship. The crews of enemy ships in actually boarding each other's craft and engaging in cutlass encounters, showed a high degree of bravery. Modern naval warfare is waged with huge, complex machines, each having innumerable operators. These attendants are drawn from the merchant fleet, and are as necessary to the main parts of the machine as a bob-stay is to a ship's mast. The courage required of these merchantmen is frequently of as high an order as that demanded of the sea fighters of 100 years ago.

Merchantmen in War Time

A few of the most important merchant craft in this class are troop-ships, mine-sweepers, hospital ships, patrol craft and colliers. In addition, every freighter that carries merchandise to or

The troop-ship or transport is a merchant vessel that works with both army and navy. Without a considerable number of these ships, a nation's superiority in war times would be jeopardized. Men and munitions of war are transported from one part of the world to another by the troop-ship. A more valuable type of vessel could hardly be devised, as in times of peace she is a heavy carrier of miscellaneous cargoes.

The fishing fleet is always an interesting branch of a merchant marine, and the craft known as steam trawlers and fish carriers are now doing most exacting work. The mine-sweeping trawlers are wonderful little vessels which, in addition to their regular duties, carry and tow landing parties from the war ships, and perform other detail work preparatory to bombard-

ments or attempts at invasion. The qualities which make the trawler useful in naval warfare are light displacement, ease and quickness of handling with helm and propeller, fair speed, buoyancy, and adaptability for ocean or river use. This type of merchant ship also takes all kinds of weather with a grin.

The steam trawler shown in Fig. 2, with her registry letters and number on the bow and quarter, is the type of craft that the British are using for mine-sweepers. Of course all distinguishing marks are obliterated and the whole vessel is protected with an almost invisible shade of lead color paint.

Hospital ships are officered and manned by merchantmen. The inevitable suffering of wounded and dying

colliers bring coal or oil to some naval depot, or direct to the war vessels. In Fig. 1 is shown an oil tanker, equipped with every modern device for fuel carriage. Such craft ply on the American, Mexican and Batum (Russian) oil routes. When not carrying oil, the tank holds can be adapted for general freight.

Using the Tramp Steamer

The greatly abused "tramp steamer", a name apt to be a misnomer, has also to be recognized. This ship is the backbone of commercial shipping and can be classed both as a national protector and a provider. Take the tramp-ship away from any maritime nation and chaos develops in the interchange of trade. These vessels may not appear within the horizon of naval war-

Merchant Marine Essay Contest

The chamber of commerce of Newport News, Va., has brought to a successful conclusion an interesting merchant marine essay contest, which was conducted in the four-year high schools of Virginia during the school year of 1914-15.

Last December the chamber of commerce, through the state department of public instruction, announced the contest, offering a gold medal to a student in each school for the best essay on "The American Merchant Marine—Its Decadence; Its Restoration", and out of 125 eligible schools 78 made application to enter the contest, which was a remarkable show-

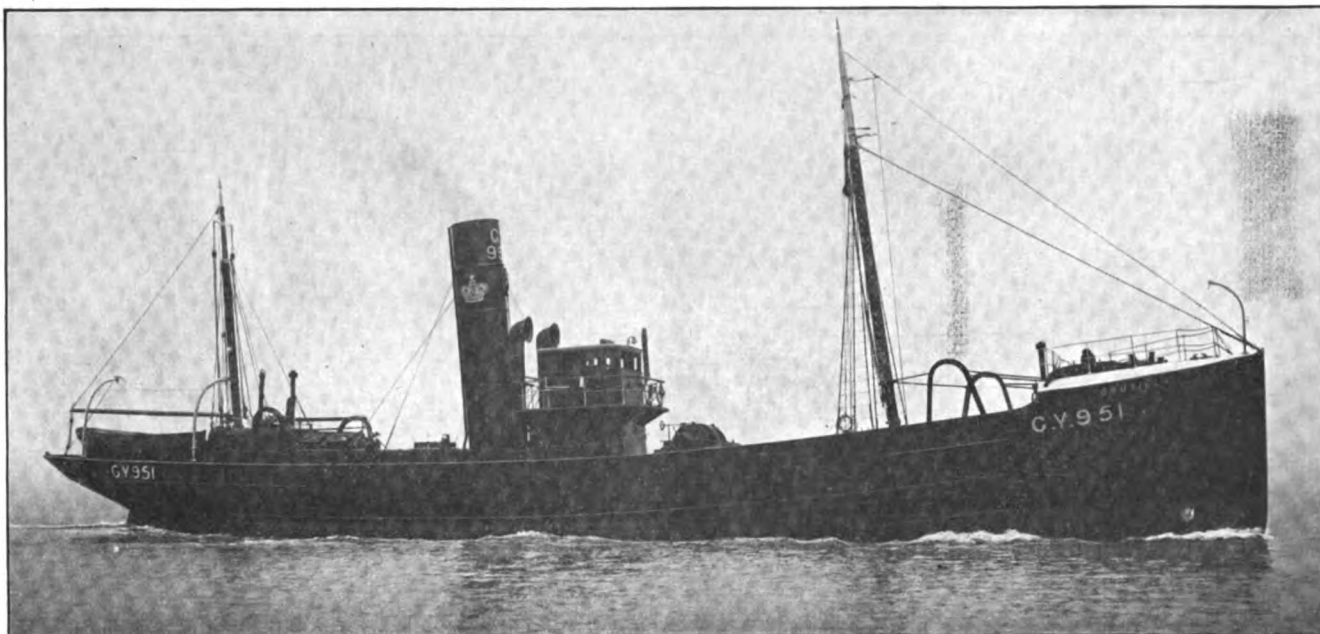


FIG. 2—TYPICAL STEAM TRAWLER EQUIPPED FOR MINE SWEEPING

seamen is partly minimized by these attendant vessels. Everything in the way of doctors, nurses and medical equipment is found on board this type of ship.

Vessels of the yacht patrol school generally are drawn from the private pleasure craft, and are used for reconnoitering, escorting and general policing of the war-zone waters. Some of the ships are donated by their wealthy owners, who use their vessels for long pleasure cruises in times of peace. High speed and light draft give this craft the agility of a naval detective.

What of the collier? Large numbers of this class of ships are doing their share in this war. The transportation of fuel, both liquid and solid, is a factor of the greatest importance, as war ships are not adapted for fueling without assistance. The merchant

fare, but they are important though hidden parts of the nation's battlefront.

Only six different types of merchant craft have been discussed and there are many others. While some are in direct attendance on the war fleets, the rest are national supports of equal importance, as the export and import trade must run smoothly, if successful naval warfare is expected.

The Panama canal has made the Cape Horn traffic heave-to, but a fleet of American merchantmen is needed to take advantage of this new trade route. Lateen craft and Arab dhows made their mark long ago in the ancient east. The Phoenicians, Spanish, Portuguese, and later the Dutch, were powerful and prosperous when they had large merchant fleets. Chance and time, the twin cousins of ripe opportunity, are now on deck. Let us build and run our own merchant fleet.

ing, as nearly the first half of the session had expired when the contest was promulgated.

In addition to offering a gold medal for the best essay in each school, the chamber of commerce inaugurated a statewide contest in which the winning essays in the schools were considered for a grand prize. The judges in this contest were Governor Henry C. Stuart, of Virginia; Attorney-General John Garland Pollard, of Virginia; and Edwin C. Ryals, managing editor of the *Richmond Times-Dispatch*. These judges, after considering all the essays submitted, awarded the grand prize to Charles M. Tucker, Richmond, Va. Mr. Tucker was awarded a handsome gold watch.

The purpose of the contest was to arouse interest in the upbuilding of the American merchant marine, and the contest, from every point of view,

has been most successful. Not only was interest aroused in the schools among the coming citizens of Virginia, but in the communities as well, and wide publicity has been given it by the daily and weekly papers published in Virginia. In one school 17 students submitted essays. It is estimated that there were nearly 400 essays written. The Newport News

chamber of commerce furnished all schools that entered the contest literature bearing on the merchant marine, so that the students might intelligently study the question. A booklet, especially prepared for the contest, was issued. The essay written by Charles M. Tucker and awarded the grand prize has attracted much attention and no small amount of praise.

Old Sloop of War Passes

Portsmouth, Which Played an Important
Part in Nation's History, Sold for Junk

By Dr. L. K. Hirshberg

"GALLANT Old PORTSMOUTH Sold as Junk for \$3,662." This heading in the *New York World* marked the inglorious end of an old and tried defender of the nation. The government had tried to save PORTSMOUTH from such a fate, but to no avail. Secretary Daniels offered to present her to any patriotic society that would take her and repair her, or to give her to the city of Portsmouth, N. H., after which she was named. But it would have cost at least \$25,000 to raise her from the mud of the Norfolk navy yard, take her any distance, and make her presentable, even as a relic. Because she had taken an active part in events on the Pacific coast which resulted in bringing California into the union, it was thought fitting by many that she should be sent to San Francisco for the exposition. In August, 1911, a bill was introduced in congress to appropriate \$25,000 to make her ready for the trip. The senate passed the bill, but the house rejected it.

PORTSMOUTH, launched in 1843, was a sister sloop of St. MARY's and was of about 1,000 tons displacement, 150 feet long, with a draught of about 17 feet. For many years she visited all parts of the world as an active unit of the navy. In 1878 she was turned over to the coast survey and 10 years later was rebuilt. From then until 1895, she served as a training ship for naval apprentices, her commander at one time being Captain Charles D. Sigsbee, who later commanded the ill-fated MAINE. Then she went to the naval militia of New Jersey until retired on account of senile debility.

PORTSMOUTH's first service of note was during the war with Mexico, a few years after she was launched. Under Commander John B. Montgomery she took possession of the San Francisco bay and the adjoining

territory, previously having met the full-rigged ship ADMITTANCE, under charter to Mexico, and forcing her to strike her colors. She towed her prize into port and soon afterward took part in the bombardment of Guaymas. She remained in these waters for several months and for two years patrolled the coast of Mexico. Then she went to Africa to keep an eye on the slave traders.

She was one of Commodore Perry's fleet when he went to Japan and negotiated the treaty which opened Japanese ports to western trade. Her longest cruise began in 1856, under Commander Foote. When she returned two years later her log showed she had traveled 49,000 miles.

Her next achievement of note was when her commander taught the Chinese the respect due the stars and stripes. It was just before the beginning of the war between England and China, and Commander Foote was with the Asiatic squadron, then under Captain James Armstrong. While endeavoring to protect the property of American residents in Canton one of the forts suddenly fired on PORTSMOUTH. No apology was forthcoming, so Commander Foote received permission to avenge the insult. He did so effectively, assisted by LEVANT and SAN JACINTO. They attacked the four forts, of massive granite 8 feet thick, mounting 176 guns and garrisoned by 5,000 men. After a fight lasting several days the four forts were captured. The American loss was 12 killed and 28 wounded, while 400 Chinese were killed.

Her last venture of note was during the civil war. When the question arose of capturing New Orleans it was determined to have the wooden ships of the navy make a bold dash along the Mississippi, past Forts Jackson and San Philip, and, should they be successful, take the city, in which

case the two forts, cut off from their base of supplies, would be compelled to surrender. By many the plan was considered foolhardy, but Admiral Farragut determined to put it into execution.

It was dark when the order was given to start. PORTSMOUTH, the flagship of the mortar flotilla, soon found her sails too slow for the frenzied rush; but she threw a line to a steamer and swept up the river with the rest of the fleet.

The attack was soon discovered by the forts and cannonading began. Still PORTSMOUTH swung ahead until she was almost directly abreast Fort Jackson, when a shot severed the line which held to her escort and she began to drift helplessly down the stream, though her guns flashed every minute. The Confederates saw her plight before she could make fast to another steamer, and concentrated their fire on her. But, aided by the tide, she swung out of danger.

June Ore Shipments

Ore shipments on the Great Lakes during June were 6,005,091 tons, against 5,502,367 tons in June, 1914, an increase of 502,724 tons. The movement to July 1 was 11,521,283 tons, an increase of 1,897,167 compared with the movement to July 1, 1914, which was 9,624,116 tons. If this proportion of increase is continued throughout the present season, the total movement of ore will be in excess of 40,000,000 tons. The shipments by ports are as follows:

Port.	June, 1914.	June, 1915.
Escanaba	580,103	720,264
Marquette	262,075	363,637
Ashland	541,315	604,127
Superior	1,997,895	926,536
Duluth	1,045,786	2,146,501
Two Harbors	1,075,193	1,244,026
	5,502,367	6,005,091
1915 increase		502,724

Port.	To July 1, 1914.	To July 1, 1915.
Escanaba	1,076,020	1,248,830
Marquette	383,948	547,002
Ashland	883,081	1,161,792
Superior	3,733,502	1,777,600
Duluth	1,779,876	4,295,811
Two Harbors	1,767,689	2,490,248
	9,624,116	11,521,283
1915 increase		1,897,167

Lake Erie Ore Receipts

Out of a total of 6,005,091 gross tons of ore shipped during June, 4,941,672 tons were received at Lake Erie ports, distributed as follows:

Port.	Gross tons.
Buffalo	621,263
Port Colborne	15,727
Erie	42,075
Conneaut	1,386,048
Ashtabula	946,437
Fairport	263,842
Cleveland	859,393
Lorain	596,293
Huron	96,785
Sandusky	
Toledo	67,125
Detroit	46,684
Total	4,941,672

War Destroys Five Hundred Vessels

In Ten Months of War Operations the Merchant Vessels Which Have Been Sunk Amount to 2 Per Cent of the World's Tonnage

TEN MONTHS' war operations of the European belligerents have wiped out approximately 2 per cent of the world's merchant tonnage. A carefully compiled record of the vessels of all classes destroyed by various means, from August, 1914, down to and including June 30, according to the *Journal of Commerce*, shows that 511 ships have been eliminated from the available tonnage. These 511 ships had a total gross tonnage of 915,457. The tonnage of some of the ships given in the record could not be learned. Therefore, the aggregate gross tonnage stated is in reality within the actual losses.

England's Tonnage Reduced by 609,934

When the war broke out last August the world's merchant tonnage of all classes was approximately 48,000,000 gross tons. Germany had under the red, white and black colors, in all parts of the world, a gross ship tonnage of about 5,082,061 tons. England led all the nations with an aggregate gross tonnage of 20,431,534 tons.

Without taking into account the number or tonnage of enemy vessels held or captured by the respective belligerents, England's gross tonnage in the first 10 months of war has been reduced 609,934 tons. A total of approximately 327 vessels flying the Union Jack had been destroyed by submarine, mine and similar war operations.

The detailed tabulations of the merchant tonnage losses by the respective nations to date, given in the accompanying table, indicate in striking manner, the power of the submarine in destroying commerce, practically half

of the vessels given in the list having been lost by such warfare. The serious danger to shipping of all classes from mines is also to be noted.

How Each Nation Has Suffered

How the various nations have suffered in the loss of tonnage, as the result of the war, is shown in the following tabulation of number and tonnage of ships lost by each of the 14 countries:

Nation—	No. of ships lost.	Gross tons.
England, including 170 merchant steamers and 157 trawlers, sailing vessels, etc.....	327	609,934
Germany, including merchant vessels of all types.....	34	102,062
Norway, including merchant vessels of all types.....	32	47,771
France, including all types.....	24	42,233
Danish, including all types.....	17	26,521
Swedish, including all types.....	22	22,903
Holland, including all types.....	13	18,132
Russian, including all types.....	17	16,024
Italy, Greece and Spain, all types.....	7	11,879
American, all types of vessels....	5	9,601
Austrian, including all types.....	4	5,691
Turkish, including all types.....	9	2,706
Total	511	915,457

With the shipping losses as a direct consequence of the war approaching 1,000,000 gross tons in 10 months, and the ship building yards of the countries engaged in war turning out very little, if any, new vessels, some shipping interests entertain the fear that there must be a serious decrease in the tonnage of the world at the end of the present year. The importance of the fact that the ship yards of the United Kingdom, France, Germany and Austria in 1913 launched merchant vessels aggregating no less than 2,635,231 tons gross is not being overlooked by owners of shipping property, who find encouragement therein that the value of their holdings will show no appreciable decrease when

the war has been brought to an end. The tables showing the tonnage losses of the respective nations given with this article, it is believed, are complete up to June 30. They were compiled from records of *The Journal of Commerce*, supplemented by official reports of the state department at Washington, the British admiralty and German war office announcements. In addition to the type of vessel the immediate cause of destruction is given, as well as the detailed and respective total gross tonnages.

Seventeen Steamers of Over 5,000 Tons Each Lost

Among the large steamers that have been destroyed as a result of the war are the following:

	Gross tons.
Lusitania (Br.)	30,396
Cap Trafalgar (Ger.).....	18,710
Kr. Wilhelm der Grosse (Ger.)	13,952
Oceanic (Br.)	17,274
Vandeyck (Br.)	10,328
La Correntina (Br.)	8,259
Elsinore (Br.)	6,542
Navarra (Ger.)	5,974
City of Winchester (Br.).....	6,601
Baden (Ger.)	7,676
Kaipara (Br.)	7,392
Cormorant (Br.)	7,595
Highland Brae (Br.)	7,634
Lovat (Br.)	6,102
San Wilfredo (Br.)	6,458
Troilus (Br.)	7,562
Princess Irene (Br.).....	6,000

The British tonnage losses, aggregating in gross tons over 600,000, are presented in detail. For purposes of convenience the losses by trawlers, sailing vessels, fishing smacks, etc., have been compiled separately from the merchant steamer losses. It is to be noted that in the early lists the casualties to British merchant tonnage were caused mainly by German cruisers and mines, while in the more recently posted losses the submarine has played a leading destructive part.

Table Giving Details of Merchant Ships Sunk in War

British Merchant Tonnage Destroyed

Name and cause—	Gross tons.
San Wilfredo, mine.....	6,458
Craigforth, mine.....	2,900
Hyades, German cruiser.....	3,352
City of Winchester, German cruiser	6,601
Kaipara, German cruiser.....	7,392
Nyanga, German cruiser.....	3,066
Holmwood, German cruiser.....	4,223
Rowes Castle, German cruiser....	4,650
Runo, mine	1,679
Oceanic, wrecked	17,274
Lovat, German cruiser.....	6,102
Indus, German cruiser.....	3,413
Killin, German cruiser.....	3,544
Diplomat, German cruiser.....	7,615
Trabloch, German cruiser.....	4,028
Clan Matheson, German cruiser....	4,775
Indian Prince, German cruiser....	2,846
Tymeric, German cruiser.....	3,314

Name and cause—	Gross tons.
King Lud, German cruiser.....	3,650
Ribera, German cruiser.....	3,500
Foyle, German cruiser.....	4,147
Selby, mine	2,137
Bankfields, German cruiser.....	3,763
Dawdon, mine	1,310
Elsinore, German cruiser.....	6,542
Ardmount, mine	3,510
Glitra, submarine	866
Chilkana, German cruiser.....	5,146
Troilus, German cruiser.....	7,562
Benmohr, German cruiser.....	4,806
Clan Grant, German cruiser.....	3,948
Cormorant, mine	7,595
Cervantes, German cruiser.....	4,635
Highland Hope, German cruiser....	5,159
Maple Branch, German cruiser....	4,338
Strathroy, German cruiser.....	4,336
Lynrowan, German cruiser.....	3,384

Name and cause—	Gross tons.
Cornish City, German cruiser....	3,816
Rio Iguassu, German cruiser.....	3,817
Niceto de Larrinaga, German cruiser	5,018
Indrani, German cruiser.....	5,706
Pruth, German cruiser.....	4,408
Condor, German cruiser.....	3,053
Manchester Commerce, mine.....	5,363
Vandeyck, German cruiser.....	10,328
Hurstdale, German cruiser.....	2,753
Glanton, German cruiser.....	3,021
Friederike, Turkish cruiser.....	3,574
Buresk, cruisers.....	4,337
La Correntina, German cruiser...	8,259
Primo, torpedoed	1,366
Malachite, submarine	718
Khartoum, mine.....	3,020
Mary Dan, mine.....	580
Charcas, German cruiser.....	5,067

Table Giving Details of Merchant Ships Sunk in War

(Continued)

British Merchant Tonnage Destroyed

(Continued)

Name and cause—	Gross tons.	Name and cause—	Gross tons.	Name and cause—	Gross tons.
North Wales, German cruiser....	3,691	Hartdale, submarine.....	3,840	Lusitania, submarine.....	30,396
Elterwater, mine.....	1,228	Headlands, submarine.....	2,998	Candidate, submarine.....	5,858
Princess Olga, mine.....	998	Indian City, submarine.....	4,645	Centurion, submarine.....	5,945
Tritonia, mine.....	4,272	Andalusian, submarine.....	2,349	Don, submarine.....	939
Drummuir, German cruiser.....	1,798	Florizan, submarine.....	4,658	Truro, submarine.....	836
Newbridge, German cruiser.....	3,737	Fingal, submarine.....	1,562	Queen Wilhelmina, submarine...	3,590
Gem, mine.....	464	Willerby, German cruiser.....	3,630	Drumcree, submarine.....	4,052
Linaria, submarine.....	3,081	Bayaono (auxiliary cruiser), sub-		Dumfries, submarine.....	4,121
Bellevue, German cruiser.....	3,814	marine.....	5,948	Glenholen, submarine.....	1,804
Elfrida, mine.....	2,624	Leeward, submarine.....	990	Morwenna, submarine.....	1,414
Durward, submarine.....	1,301	Glenartney, submarine.....	5,201	Princess Irene (auxiliary cruiser),	
Viknor, wrecked.....	5,386	Cairntorr, submarine.....	3,588	blown up.....	6,000
Tokomaru, submarine.....	6,084	Concord, submarine.....	2,861	Cadby, submarine.....	1,130
Ben Cruachan, submarine.....	3,092	Falaba, submarine.....	4,806	Ethiopia, submarine.....	3,794
Kilcoan, submarine.....	422	Vosges, submarine.....	1,295	Spennymoor, submarine.....	4,008
Linda Blanche, submarine.....	530	Aguila, submarine.....	2,114	Glenlee, submarine.....	4,140
Oriole, submarine.....	1,489	Crown of Castle, submarine.....	4,505	Tullochmoor, submarine.....	3,520
London Trader, submarine.....		Flaminian, submarine.....	3,440	River Clyde, ashore.....	3,913
Ikaria, submarine.....	2,828	Eston, submarine.....	3,837	Dixiana, submarine.....	3,329
Wavelet, mine.....	1,918	Olivine, submarine.....	634	Saidich, submarine.....	3,303
Dulwich, submarine.....	3,298	City of Bremen, submarine.....	1,258	Inkum, submarine.....	4,747
Highland Brae, German cruiser...	7,634	Lockwood, submarine.....	2,042	Iona, submarine.....	3,344
Potaro, German cruiser.....	2,810	Northlands, submarine.....	2,776	Victoria, submarine.....	
Hemisphere, German cruiser.....	2,230	Harpalyce, submarine.....	5,940	Ailsa, submarine.....	876
Cambank, submarine.....	1,990	The President, submarine.....	647	Dulcie, submarine.....	2,050
Banksome Chine, mine.....	1,292	Tamar, German cruiser.....	3,207	Carisbrook, submarine.....	2,532
Clan McNaughton, mine.....	3,103	Coleby, German cruiser.....	3,824	Tunisian, submarine.....	4,220
Oakby, mine.....	1,251	Ptarmigan, submarine.....	784	Lady Salisbury, submarine.....	1,446
Bengrove, submarine.....	3,840	Mobile, submarine.....	1,950	Erna Boldt, submarine.....	
Tangistan, submarine.....	3,738	Bankdale, submarine.....	3,110	Strathcarron, submarine.....	2,807
Blackwood, submarine.....	1,230	Indulgent, submarine.....	2,008	Hopemount, submarine.....	3,300
Princess Victoria, submarine.....	1,095	Assiout, mine.....	3,146	Arndale, mine.....	3,538
Rio Parana, submarine.....	4,015	City of Khios, mine.....	3,496	Strathcairn, submarine.....	4,336
Western Coast, submarine.....	1,166	Billiter, mine.....	832	Indrants, submarine.....	3,640
Harpalion, submarine.....	5,867	Cherbury, submarine.....	3,220	Mary Ada Shoart, German cruiser	2,605
Deptford, mine.....	1,208	Menterne, submarine.....	3,018	170 steamers—Total gross tons.	577,986

British Trawlers, Smacks and Sailing Vessels Destroyed

Name and cause—	Gross tons.	Name and cause—	Gross tons.	Name and cause—	Gross tons.
Crathie, mine.....	210	Sapphire, mine.....	289	St. Georges, submarine.....	165
Thomas W. Irwin, mine.....	201	Kildalton (sailing vessel), German		Angelo, submarine.....	173
Barley Rig, mine.....		cruiser.....	1,591	Condor, mine.....	151
Tubal Cain, German cruiser.....	277	Invercoe (sail vessel), German		Chrysoprassus, submarine.....	119
Seti, mine.....	160	cruiser.....	1,322	Hirose, submarine.....	274
Eyrie, mine.....		Conway Castle (sail vessel), sub-		Ebenezer, submarine.....	113
Fittonia, mine.....	146	marine.....	1,591	Ena May, submarine.....	
Ajax, mine.....	120	Jason, submarine.....	176	Evening Star, submarine.....	120
Lindsell, mine.....		Nellie, submarine.....	109	Gazehound, submarine.....	138
Valiant, mine.....	198	Gloxinia, submarine.....	145	George and Mary, submarine.....	78
Imperialist, mine.....	346	Acantha, submarine.....	322	Kathleen, submarine.....	198
Revigo, mine.....	230	Marina, submarine.....	154	Bardolph, submarine.....	215
Ceylon, mine.....	146	Panilla, submarine.....	158	Cortes, submarine.....	174
Capricornus, mine.....	194	St. Lawrence, submarine.....	196	Curlew, submarine.....	134
Argonaut, mine.....	225	Pecolo, submarine.....	176	Dogberry, submarine.....	213
Lobelia, mine.....	147	Lilydale, submarine.....	129	Duke of Wellington, submarine...	182
Harrier, mine.....	208	Paux Hero, mine.....	221	Euclid, submarine.....	165
Chameleon, mine.....	132	Columbia, submarine.....	266	King Charles, submarine.....	163
Pegasus, mine.....	155	Stirling, submarine.....	105	Dunnet Head, submarine.....	343
Pollux, mine.....	182	Martaban, submarine.....	148	Persimon, submarine.....	225
Rideo, mine.....	230	Mercury, submarine.....	222	Star of the West, submarine.....	197
Rhine, mine.....	117	Sunray, submarine.....	165	Strathbaa, submarine.....	193
Fortuna, mine.....	259	Emblem, submarine.....	157	E. and C. (smack), submarine....	
Skirbeck, mine.....	171	Scottish Prince, submarine.....	125	Economy (ketch), submarine.....	
Wigtoft, mine.....	155	Uxbridge, mine.....	164	Roy Horace (ketch), submarine...	
Walrus, mine.....	159	Don, mine.....	151	Artu, submarine.....	169
Flavian, mine.....	186	St. Louis No. 1 (submarine).....	211	Dromio, submarine.....	208
Julian, mine.....	185	Benington, submarine.....	126	Sunlight (sail vessel), submarine...	1,298
Indian, mine.....	185	Hellenic, mine.....	159	Pentland, submarine.....	205
Porpoise, mine.....	159	Earl of Latham (sailing vessel),		Tunisian, submarine.....	211
Lindsey, mine.....	144	submarine.....	100	Castor, submarine.....	182
Kesteven, mine.....	150	Sceptre, submarine.....	160	Nottingham, submarine.....	165
Marnnay, mine.....	153	Bob White, submarine.....	192	Velocity, submarine.....	186
Mersey, mine.....	190	Hero, submarine.....	173	Qui Vive, submarine.....	
Zenobia, German cruiser.....	152	Iolanthe, submarine.....	179	Edward, submarine.....	
Kilmarnock, mine.....	165	Northward Ho, submarine.....	180	Cardiff, submarine.....	163
Rebano, mine.....	176	Rugby, submarine.....	205	Welfare (smack), Zeppelin.....	
St. Cuthbert, torpedoed.....	189	Progress, submarine.....	273	Laurestina (smack), Zeppelin....	
Lily, mine.....		Coquette, submarine.....	176	Crown of India (bark), submarine	2,056
Princess Beatrice, mine.....	214	Hector, submarine.....	179	Plymouth, submarine.....	165
Drumoak, mine.....	208	Cruiser, submarine.....	146	Petrel, submarine.....	
Ponrabbel, German cruiser.....	473	Merrie Islington, submarine.....	147	Explorer, submarine.....	
Rosella, mine.....	243	Stanton, submarine.....	198	Japonica, submarine.....	
Fraternal, mine.....		Cancer, submarine.....	183	Argyl, submarine.....	280
Capious, mine.....	100	Chrysolite, submarine.....	222	Saturn, submarine.....	183
Will and Maggie, mine.....		Criumond, submarine.....	173		
Mary, mine.....	256	Lucerne, submarine.....	198		
Calphurnia, mine.....	284				
Linnets, mine.....	210				
Lord Carnarvon, mine.....					
Symelicus, mine.....					
Ocana, mine.....	260				
Orianda, mine.....	273				
Garmo, mine.....	205				
Night Hawk, mine.....	287				
Windsor, mine.....	172				
Earl Howard, mine.....	226				
Wilfred M. (schooner), German					
cruiser.....	199				

Norwegian Tonnage Destroyed

Name and cause—	Gross tons.	Name and cause—	Gross tons.
Tysla, mine.....	4,676	Eli, mine.....	1,107
Gottfried, mine.....	426	Castor, mine.....	1,313
Hesvik, mine.....	1,234	Nordeap, mine.....	329
Tromo, mine.....	694	Samantha (bark), German cruiser	2,211
Pluton, mine.....	1,597	Belridge, German submarine.....	4,420
Vaaren, mine.....	1,090	Bjarka, mine.....	620
Boston, mine.....	1,168	Begin, mine.....	1,107

Table Giving Details of Merchant Ships Sunk in War

(Continued)

Norwegian Tonnage Destroyed

(Continued)

Name and cause—	Gross tons.
Nor (sailing vessel), German submarine	498
Kuprivi, mine	2,932
Oscar (sailing vessel), German submarine	712
Eva (sailing vessel), German submarine	270
America, German submarine	3,830
Balduin, German submarine	1,059

Name and cause—	Gross tons.
Laila, German submarine	753
Minerva, German submarine	3,736
Cubano, German submarine	4,337
Glitterlind, German submarine	717
Superb (sailing vessel), German submarine	1,393
Trud Vang, German submarine	1,040
Nova, German submarine	1,557
Bellglade (bark), German submarine	

Name and cause—	Gross tons.
marine	665
Davanger, German submarine	2,280
Granem Nor (sail vessel), German cruiser .....	...
Cambus-Kenneth, German submarine .....	...
Gjeso, German submarine .....	...
Total, 32 vessels, gross tons...	47,771

German Tonnage Destroyed

Name and cause—	Gross tons.
Koenigin Luise (British destroyer)	2,168
Kaiser Wilhelm der Grosse (British cruiser)	13,952
Cap Trafalgar, British cruiser	18,710
Nachtigal, British gunboat	249
Rheinland (motor schooner), after capture	333
Herzogin Elizabeth, to prevent capture	548
Walkure, to prevent capture	3,836
Markomannia, British cruiser	4,505
Santa Catherina, after capture	4,247
Aeolus (power schooner), Japanese	

Name and cause—	Gross tons.
cruiser	150
Anna Woermann, British cruiser	2,335
Lome (river steamer), Br. cruiser	115
Kuka (river steamer), Br. cruiser	602
Ado (river steamer), Br. cruiser	383
Oyo (river steamer), Br. cruiser	326
Epe (river steamer), Br. cruiser	324
Ondo (river steamer), Br. cruiser	271
Ereko (river steamer), Br. cruiser	453
Eggo (river steamer), Br. cruiser	453
Ekbatana, sunk	4,513
Elsheth, British cruiser	1,631
Derindje, Russian cruiser	3,373

Name and cause—	Gross tons.
Durendart, Japanese cruiser	3,844
Ellen Rickmers, Japanese cruiser	4,117
Michael Jebben, Japanese cruiser	1,521
Baden, British cruiser	7,676
Santa Isabel, British cruiser	5,199
Somali, sunk	2,550
Eleonore Woermann, Br. cruiser	4,024
Navarra, to avoid capture	5,974
Konigsberg, mine	959
Grete Hemsoth, mine	2,457
Ayesha (sailing vessel), mine	97
Hindenburg, Russian submarine .....	...
Total, 34 vessels, gross tons...	102,062

French Tonnage Destroyed

Name and cause—	Gross tons.
Dinorah, German submarine	2,962
Ville de Lille, German submarine	997
Mont Agel, German cruiser	4,803
Antoinette, German submarine	419
Union (bark), German cruiser	2,023
Valentine (ship), German cruiser	2,756
Admiral Gauteaume, mine	4,590
Jean (sail vessel), German cruiser	1,944
Marie (trawler), mine	261
Guadeloupe, German cruiser	660

Name and cause—	Gross tons.
Gris Nez (trawler), submarine	208
Floride, German cruiser	6,629
Pierre Loti (sail vessel), German cruiser	1,926
Jacobsen (sail vessel), German cruiser	1,950
Auguste Conseil, submarine	2,952
Casablanca (mine layer), mine	169
Diamant (schooner), submarine	241
St. George (trawler), submarine	165

Name and cause—	Gross tons.
Penfield, submarine	794
Emma, submarine	1,617
Paquerette (sail vessel), submarine	326
Chateaubriand (sail vessel), submarine	2,029
La Liberté (sail vessel), submarine	241
Anna de Bretagne (ship), German cruiser	1,571
24 vessels—Total gross tons...	42,233

Russian Tonnage Destroyed

Name and cause—	Gross tons.
Express, mine	717
Walta, mine	1,361
Kasbek, mine .....	...
Yenessei (transport), submarine .....	...
Adolf (sail vessel), submarine	154
Thomasina (bark), submarine .....	...

Name and cause—	Gross tons.
Dania, submarine	2,648
Akus, mine	341
Isabel (sail vessel), Ger. cruiser	1,231
Hermes (sail vessel), submarine	973
Strack, submarine	849
Svorona, submarine	3,120

Name and cause—	Gross tons.
Makkavie, mine	1,727
Mars (sail vessel), submarine	227
Montrosa (sail vessel), mine	984
Providence, submarine	748
Vostachnaya Zvezda, submarine	944
17 vessels—total gross tons...	16,024

Swedish Tonnage Destroyed

Name and cause—	Gross tons.
St. Paul, mine	2,534
Specia, mine .....	...
Drott, mine	1,286
Everilda, mine	1,366
Luna, mine	1,095
Andrea, mine	1,412
Ornen, mine	191
Atle, mine	1,183

Name and cause—	Gross tons.
Hanna, German submarine	1,573
Volke, mine	1,352
Ruth, German submarine	838
Pentrie, mine	1,612
Elida, German submarine	1,693
Elsa (sail vessel), German submarine	100
Hernodia, mine	2,100

Name and cause—	Gross tons.
Johan Nyberg, mine .....	...
M. Roosval (sail vessel), mine	287
Lappland, German submarine	2,238
Otago, German submarine	1,410
Torsten, German submarine .....	...
Verdani, German cruiser .....	...
Nora Scerige, mine	723
22 vessels—Total gross tons...	22,903

Danish Tonnage Destroyed

Name and cause—	Gross tons.
Maryland, mine	5,136
Chr. Broberg, mine	1,225
Skuli Fogeti (trawler)	272
Gaea (sail vessel), mine	199
Kamina, mine	1,270
M. C. Holm, mine	2,458
Ingolf, mine	968

Name and cause—	Gross tons.
Cathay, submarine	4,076
Lillian Drost, mine	1,961
Martha, submarine	1,182
Betty, submarine	2,109
Ely, mine	1,747
Soborg, submarine	2,108

Name and cause—	Gross tons.
Salvador (sail vessel), submarine	141
Cyrus, submarine	1,669
Katrine (schooner), submarine .....	...
Cocos Mestral (schooner, submarine) .....	...
17 vessels—Total gross tons...	26,521

Turkish Tonnage Destroyed

Name and cause—	Gross tons.
John O. Scott, sunk	859
Marie Rosette (transport), sunk	759
Nilifer (mine layer), sunk	1,088
Midhat (transport), Russ. cruiser .....	...
Bahri Amer. (transport), Russian cruiser .....	...
Bezmi Alem (transport), Russian cruiser .....	...
No. 62 (transport), submarine .....	...
Bulbul (transport), submarine .....	...
Nagara (transport), submarine .....	...
9 vessels—Total gross tons...	2,706

Austrian Tonnage Destroyed

Name and cause—	Gross tons.
Baron Gautsch, mine	2,069
Bathori, British cruiser	2,223
Boun Padre, mine	647
Josephine, mine	752
4 vessels—Total gross tons...	5,691

American Tonnage Destroyed

Name and cause—	Gross tons.
Wm. P. Frye (schooner), German cruiser	2,998
Greenbrier, mine	3,331
Evelyn, mine	1,185
Carib, mine	2,087
Washington, by Turks or Russians .....	...
5 vessels—Total gross tons...	9,601

Losses of Italy, Greece and Spain

Name and cause—	Gross tons.
Horacio, (Spain), mine	1,461
Varese (Ital.), mine	1,703
Nikoa (Greek), Russian cruiser	648
Georgios (Greek), submarine	796
Astrea (Ital.), submarine	2,123
Illinipontos (Greek), submarine	2,989
Virginia (Greek), mine	1,159
7 vessels—Total gross tons...	11,879

Tonnage of Dutch Ships Destroyed

Name and cause—	Gross tons.
Houttjik, mine	2,336
Alice H., mine	3,052
Leersum, mine	1,455
Nieuwland, mine	927
Maria, German cruiser	3,804
Poolster (fish lugger), mine	101
Stemmer 2 (fish lugger), mine .....	...
Medea, German submarine	1,235
Amstel, mine	853
Katwijk, German submarine	2,040
Olanda, mine	2,138
Rijndam, mine	191
Letty (trawler), mine .....	...
13 vessels—Total gross tons...	18,132

TOTAL NUMBER SHIPS DESTROYED	511
TOTAL GROSS TONNAGE LOST	915,457

Using Trucks to Secure Business

Lake Michigan Shippers Double Their Freight Traffic With Aid of Motor Trucks—Details of This Successful Innovation

By R. V. Sawhill

ASK AN executive official of any boat line that handles miscellaneous package freight, what are the big transportation problems he is trying to solve and very likely he will answer unhesitatingly that he is puzzling over the question of getting closer to the small producer.

A boat is handicapped by its lack of mobility. Its trade route is restricted to navigable waters and when a producing center, either industrial or agricultural, develops away from the shore line, the vesselman is forced to watch this traffic go to the steam or electric lines. The transportation company which can bring its facilities to the producer, instead of forcing him to haul his freight to some distant terminal, always secures the business. Shipping interests have realized the truth of this statement for years, but in most cases were unable to devise a feasible plan for obtaining this traffic.

The problem has been solved, however, within the past few weeks by the vessel operators engaged in the Lake Michigan fruit trade. The oldest transportation agency, shipping by water, has called to its assistance the newest, the motor truck. Through the use of these rapid and powerful vehicles, the oper-

ators in the fruit carrying trade expect to practically double the volume of traffic.

The scheme of operating these trucks is simple. Light, speedy trucks as shown in Fig. 1, will be used for scouring the countryside and collecting the consignments of fruit which the individual farmers formerly were forced to haul to the port by wagon. The ground covering abilities of these light trucks will permit them to visit farmers located at a considerable distance from the lake shore, who previously have turned over their business to the railroad or electric lines in preference to making long 20 or 25 mile drives to the dock. Despite the fact that the new plan is still on trial, the vessel operators of Lake Michigan feel confident of its success and are at a loss to understand why it was not put into effect earlier.

The operations on Lake Michigan have suggested a much wider field for the use of motor trucks in connection with the package freight business. Along the Atlantic, Pacific and Gulf coasts, as well as the Great Lakes, a great many industrial communities are found at distances ranging from 10 to 25 miles inland. This distance has always deterred the manufacturers in these cities from tak-

ing advantage of the lower water carrying rates. In preference to assuming the cost and delay of transporting their finished products by motor truck or wagon to the nearest port, these manufacturers willingly pay the higher freight on the all-rail route.

In fact, it is safe to assume that many manufacturers located only a short distance from navigable water, have never even considered the use of steamers in handling their products owing to the difficulty of delivering their goods to the boat. Water freight lines by announcing regular motor truck service to these communities could readily secure a large portion of the business which ordinarily goes to the railroads. The cost of this service to the vessel operators would be small when compared with that which individual manufacturers would have to bear in transporting only occasional shipments to the coast. A small charge made by the shipping interests to defray the expense of this motor truck service, when added to the lower freight rates by water, would still leave a comfortable margin between their rates and the all-rail tariff.

The experiment which is being made by the Lake Michigan vessel operators is being watched with interest by freight

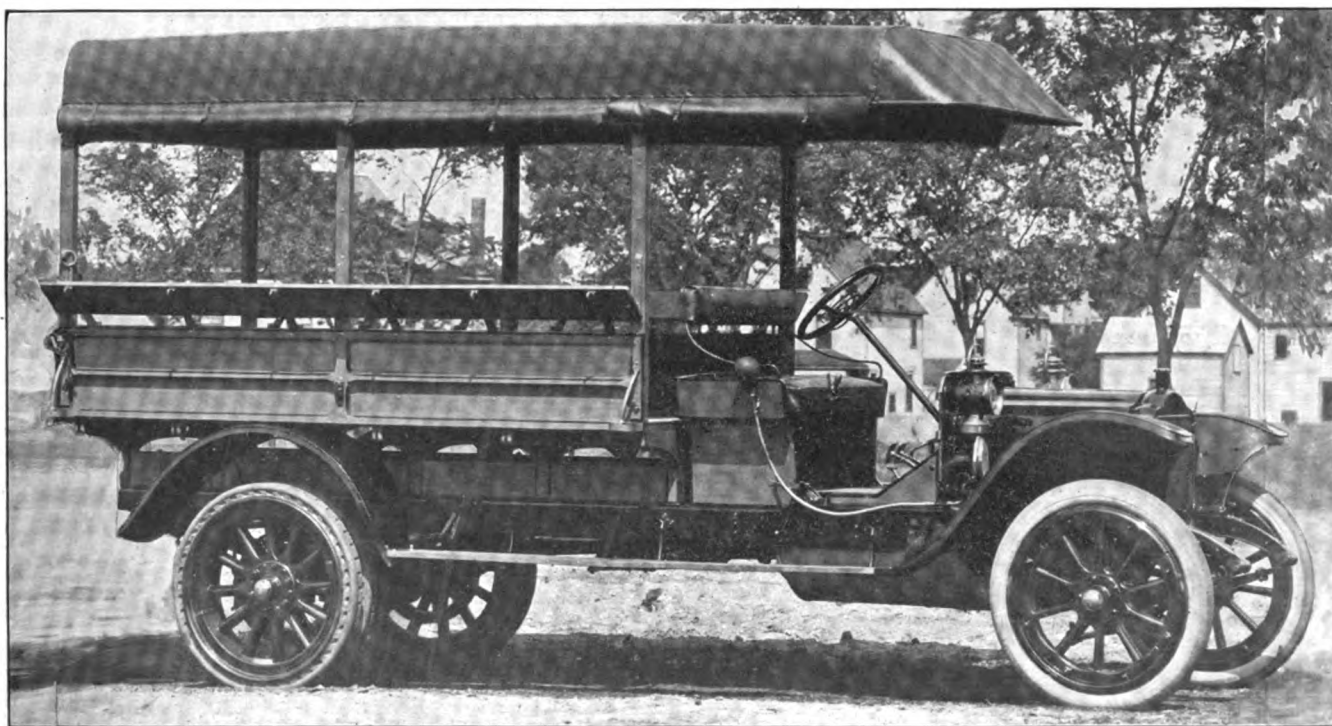


FIG. 1—TYPE OF TRUCK USED IN FRUIT BELT

carrying lines not only on the Great Lakes but at different points along the sea coast. Its successful operation will doubtless result in a wide extension of its use.

The two Lake Michigan steamship companies which are experimenting with the use of trucks are the Graham & Morton Transportation Co. operating a fleet of four ships out of Benton Harbor, St. Joseph and Holland, Mich., and the Chicago & South Haven Steamship

1/5-bushel baskets, 44,107 1/3-bushel baskets, 84,000 bushel baskets and 61,167 barrels of fruit, these figures demonstrating the immensity of this traffic on Lake Michigan. The volume of traffic is constant from the time the first shipments of strawberries are made about June 1, until the last barrels of apples are received about Nov. 15. The fruit includes all classes such as strawberries, cherries, plums, apricots, pears, apples, currants, raspberries, peaches,

which approached closer to their farms. With motor trucks, the South Haven line can easily reach farmers located 25 or 30 miles away from its dock, thus drawing trade from a territory about four times as large as that which has furnished the business previously. For this reason the South Haven line expects to carry an immensely increased volume of fruit this summer.

Two 2-ton and one 4-ton truck have already been put in service and two more small trucks will be added within the next few days. These trucks operate out of the villages of Bangor and Breedsville, which are located 12 miles east of South Haven and are about four miles apart. The large 4-ton truck runs between these two towns and South Haven, while the lighter and faster trucks cover regular routes in all directions from these two towns and bring their loads to the central station to be handled by the larger truck. By this arrangement, a fleet of speedy trucks is continuously at work securing the consignments of fruit from the farmers at all points within a 25 or 30 mile radius of South Haven. The heavier and slower truck operates only between the central collecting stations and the port. The light trucks can make as high as 30 miles an hour, but owing to the delays incurred in stopping, are expected to average about 12 miles per hour.

The advantages of shipping by water are understood by the farmers in the Michigan fruit belt and the experiment with the motor trucks has not only awakened a deep interest, but was liberally patronized from the beginning. The farmer is saved the expense and inconvenience of hauling his shipments to some terminal. In addition, water transportation of fruit has many advantages over an all-rail route. The fruit steamers operating out of the various towns along the western coast of Michigan cover the run between these ports and Chicago in four to eight hours. There is no need for refrigeration as the goods are transported entirely at night when the air is cool. The majority of the fruit steamers reach Chicago and have their shipments ready for delivery at 5 o'clock in the morning, giving quicker dispatch than can be secured with electric or steam lines. In addition the fruit is handled with less jolting and reaches the Chicago market in a fresher condition. The Lake Michigan fruit shippers also have an additional advantage in the Chicago market as the commission houses through which the fruit is handled are located at points immediately contiguous to the docks.

Quick delivery also is possible upon the receipt of the fruit at the dock. When the steamers arrive, 50 men are used to carry the fruit from the hold of the vessel to the dock. The fruit is

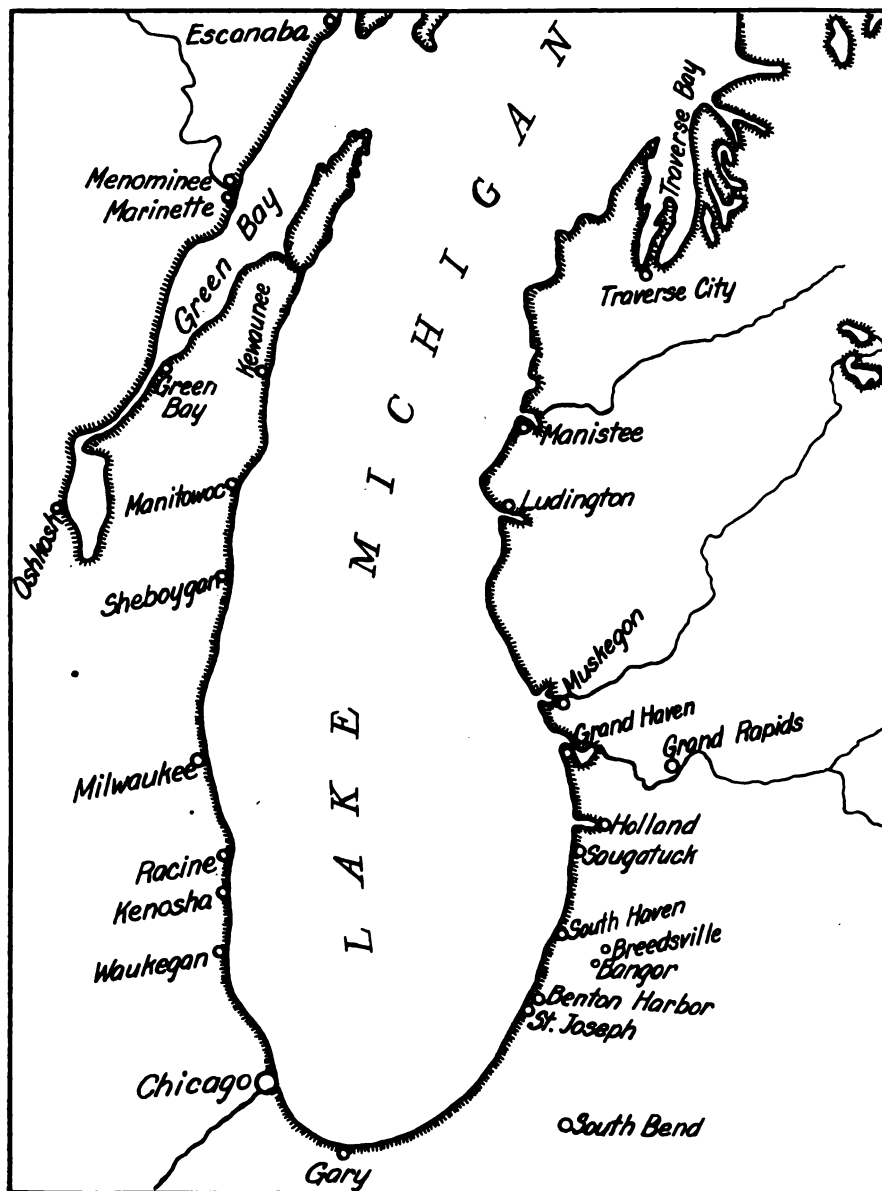


FIG. 2—PRINCIPAL PORTS IN FRUIT TRADE

Co. operating two ships between Chicago and South Haven, Mich. Both companies have had the trucks in service for only a few weeks, but the results already obtained are sufficient to warrant continuing them in service for the balance of the season.

The methods followed by the South Haven line are typical of both experiments. This line for years has handled a large volume of trade from South Haven. In 1914, the South Haven line handled 117,107 1/2-bushel crates, 185,000

etc. The farmers who have furnished business to the South Haven line for a number of years, live in a semi-circle having a radius of 15 miles, with the port of South Haven as the center. The majority of the trade has been received from farmers living within eight to 10 miles from the coast. In other words, the farmers who lived at a distance which required a 25 or 35 mile drive to bring their fruit to the port and return home, preferred to pay the higher rate charged by the steam or electric lines

sorted according to the company to which it is to be delivered, regardless of individual consignments by the farmers. A bulk receipt is taken from the consignee, thus insuring quick delivery. In the railroad service the fruit is sorted and checked according to individual shipments and there is considerable delay in handling it from the cars to the consignee, while in addition the railroad terminals are located at some distance from the fruit warehouses. The methods pursued by the steamship company result in more claims being filed, but have the advantage of quick dispatch.

The cost of the motor truck service to the farmer is nominal. The freight rate from South Haven to Chicago by water is eight cents per crate. The South Haven line transports the fruit from the farmhouse to the port for three cents a crate. The farmer thus pays 11 cents for the transportation of a crate of fruit from his residence to the warehouse of the consignee in Chicago. On average sales the farmer receives from \$1.25 to \$1.35 a crate for his fruit. After deducting freight, commissions, etc., he receives on an average, a net return of 75 to 80 cents per crate. By permitting the steamship line to rid him of the inconvenience of transporting his fruit for long distances by wagon, the farmer's net profit is cut to an average of 72 to 77 cents, a nominal reduction. But the farmer knows he cannot haul his own fruit for nothing, even to the railway station.

An example of the type of steamers engaged in the Lake Michigan fruit trade is shown in Fig. 3. This illustration shows the steamer UNITED STATES tied up at the wharf at Saugatuck, Mich. The boat is operated by the Indiana Transportation Co. and in 1914 this one steamer handled 86,622 1/5-bushel baskets; 37,911 1/2-bushel baskets; 68,200 bushel baskets; 29,752 barrels and 156 sacks of fruit. The vessels are used both for carrying fruit and passengers. A cargo of general merchandise is carried on the return trip from Chicago to the Michigan ports.

The steamers operated by the South Haven line in the fruit trade are PETOSKEY and CITY OF SOUTH HAVEN. The former is run on the fruit trade during the entire summer while the latter serves as a passenger and excursion boat from the opening of the season until Labor day. PETOSKEY is 170 feet long, 36-foot beam and has a carrying capacity of about 10,000 bushels.

Various methods previously had been used by the vessel interests in obtaining traffic from distant points in the fruit belt. The most common method was by the use of wagons of the prairie schooner type drawn by horses, which made calls on regular routes through the

fruit belt. In addition the western counties of Michigan are provided with a network of electric lines which in a number of cases serve as feeders to the boat lines. These electric package routes connect with the boat lines at Grand Haven, Muskegon, Holland and St. Joseph.

Another method that was followed, where navigable rivers were found, was to send a fleet of small boats in tow of a launch up the river and collect the consignments of fruit from the farmers along the valley.

The development of the Michigan fruit growing industry has resulted in a demand for better roads in the fruit belt and considerable success has been

Muskegon while the Northern Michigan Transportation Co. reaches the farmers in the Grand Traverse county. The Crosby Transportation Co., operating out of Milwaukee, reaches Grand Haven and Muskegon and makes use of small tenders that gather up shipments from different lake ports, bringing them to the company's docks.

In addition the Door county peninsula, between Green Bay and Lake Michigan, is rapidly growing in importance as a fruit bearing district. The Goodrich company recently acquired CITY OF HOLLAND, a large side wheeler formerly known as CITY OF MILWAUKEE, and probably will place this steamer in the fruit carrying trade out of Green Bay.

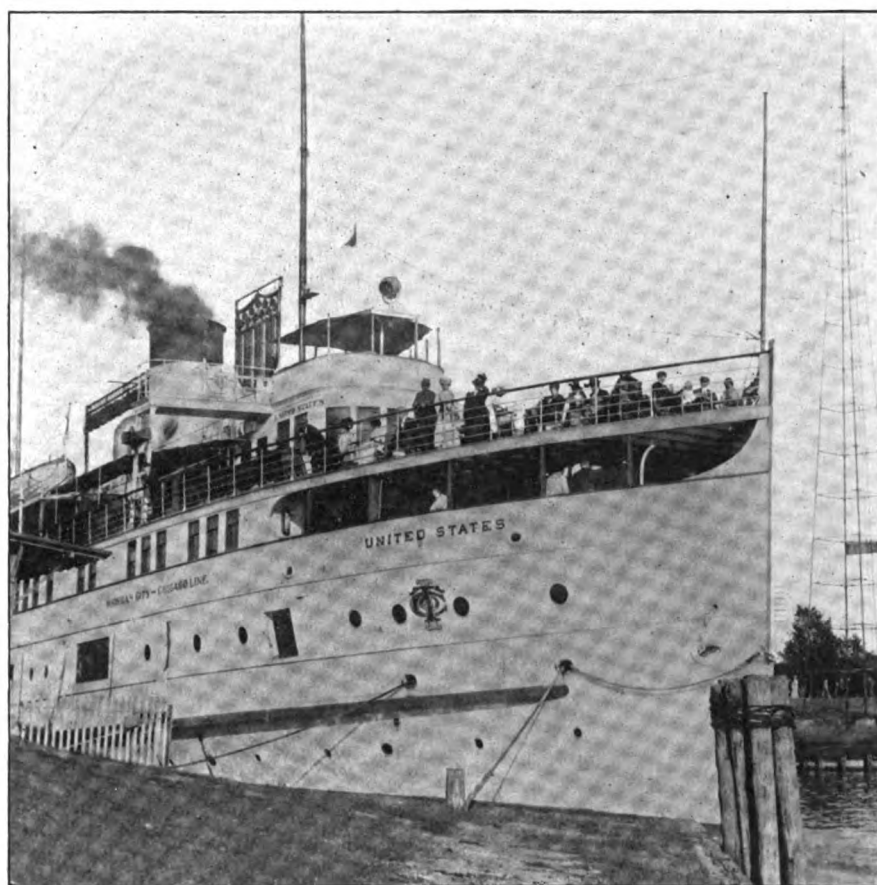


FIG. 3—TYPICAL FRUIT CARRIER

met by the farmers and transportation companies in securing the improvement of roads which connect the orchards and the lake.

Among the companies operating in the fruit trade are the Graham & Morton Transportation Co., one of the pioneer lines in the Michigan fruit carrying business, which operates a fleet of four steamers between Chicago and Benton Harbor, St. Joseph and Holland. The Indiana Transportation Co. has two large passenger and freight steamers in the fruit carrying trade between Chicago and Saugatuck. The Goodrich Transit Co. operates from Grand Haven and

New Owners for Cramp Ship Yard

With a purchase of 6,550 shares of stock of the William Cramp & Sons Ship & Engine Building Co., Philadelphia, all interest of the Cramp family in the ship building plant, started by William Cramp in 1830, has passed into the control of others. There will be no change in the management. Seventy-five per cent of the shares are held in a voting trust consisting of E. T. Stotesbury, Levi L. Rue and George F. Baker.

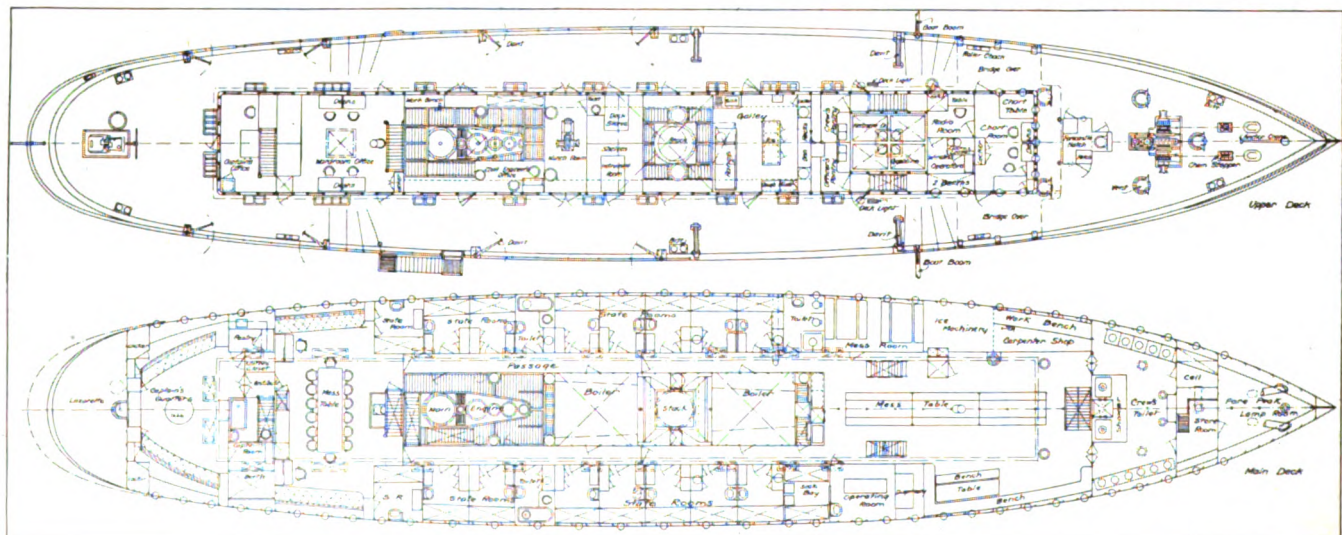
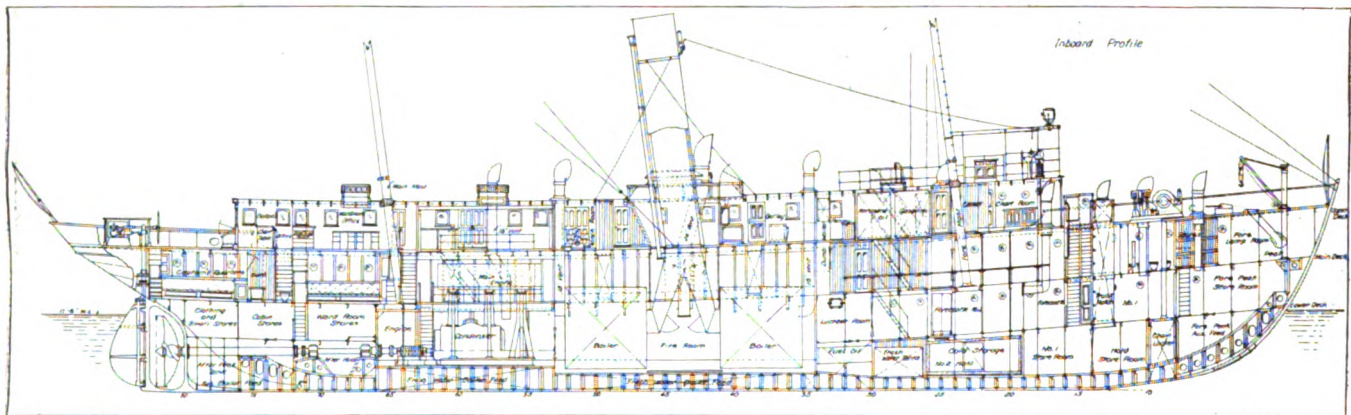
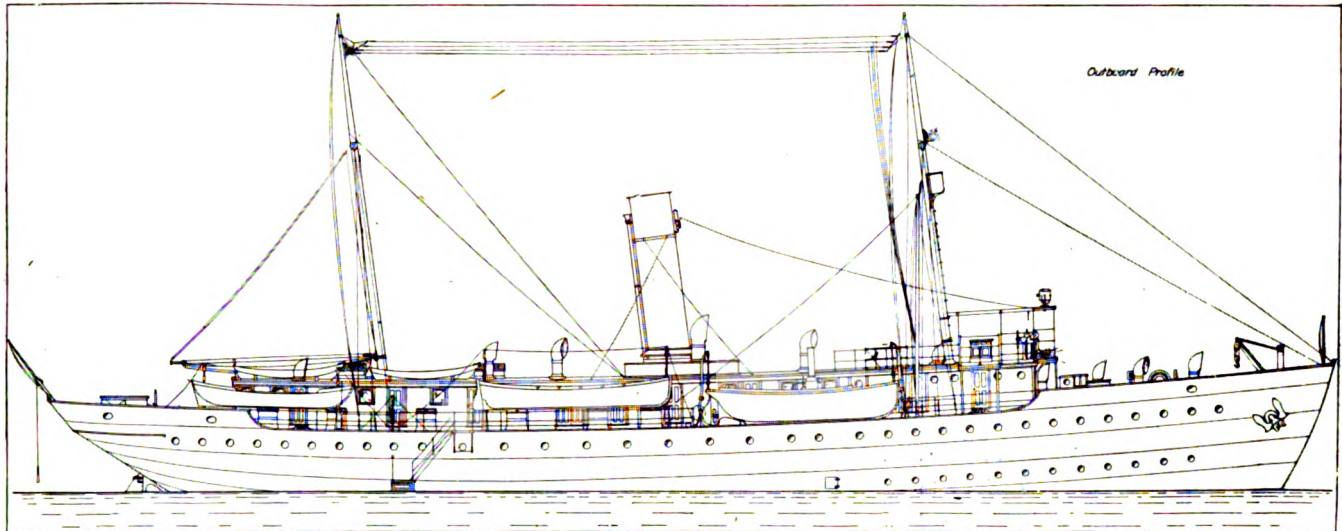
Surveyor's Lines Arouse Interest

New Vessel for U. S. Coast and Geodetic Survey
Will Be Used in Exploration of Alaskan Waters

CONSIDERABLE interest has been manifested in plans and specification for SURVEYOR, the new United States coast and geodetic survey vessel, sent to prospective bidders July 1, as told in last month's issue of *The Marine Review*, page 247.

She is a two-deck single-screw steel steamer, with a triple expansion 1,000-horsepower engine and two Scotch boilers burning crude oil fuel. She will have a double bottom the full length of the engine and boiler space, joining watertight compartments fore

and aft. Her length over all will be 186 feet, at the water line 160 feet, her beam 34 feet, and her depth 20½ feet, with a load draft of 11½ feet. She will carry 230 tons of fuel, giving an 8,000-mile steaming radius. SURVEYOR's lines are indicated below.



Told by the Oldtime River Pilot

William H. Harrison's Anecdotes Recall Grim Days When Skill
and Daring of Mississippi Wheelmen Saved a Fleet to the Nation

By F. J. Koch

THE stern old breed of river pilots is fast disappearing. Changing transportation methods have to a great extent robbed them of their occupation. Here and there one may be found, bent and grizzled now but hale as ever, and more than willing to recall to his hearer the great days when America's inland commerce depended on the skill of his profession. He will tell of the perilous times of '61-'65, when the daring of river pilots made possible the victories of David Glasgow Farragut and "Essex" Porter's valiant son—victories which won the Mississippi and cut the Confederacy in two.

A living reminder of the heyday of river pilotage is venerable Captain William H. Harrison, of Cincinnati, relative of the late President Benjamin Harrison and a veteran of the Civil war. The son of a bank-side tavern keeper at Cullom's Ripple, O., Harrison ran away from home and stowed away on the famous old *RARITAN* when a mere boy. He was discovered and put off at Louisville. Here a friendly steamboat captain, knowing young Harrison's father as an old river man, found the lad and gave him passage home. Recognizing the nautical strain in his son's makeup, the elder Harrison apprenticed him to two seasoned captains, Phil Hecker and Sam Fletcher. In those days the professional riverman was a character who exacted and received not only respect but the handsomest of emoluments. Fifty-six steamers plied between Cincinnati and New Orleans in the fifties, and the pilots were sought after. Captain Powers of *SHAMROCK* paid his helmsman \$75 "and all found" for every one-way trip of eight or 10 days. A round trip often consumed 25 days, when barges were towed. Famous vessels plied the Father of Waters then, before the darkey on the safety-valve and the furniture stripped to feed the furnaces had become a myth. Such craft were the big side-wheelers *ATLANTIS* and *ZACHARY TAYLOR*. On these and other boats equally memorable in the annals of inland navigation, young Harrison learned the trick of the wheel and the uncanny knowledge of the river's eccentricities, which were soon to prove of value to his country.

All of the old-school pilots hark back in their reminiscences to Civil War



CAPTAIN WILLIAM H. HARRISON

times. In '61 Harrison, for some years a full fledged navigator, went into government service and for a year guided vessels carrying recruits to the Union armies.

A Hunt for Pilots

Commodore Farragut reached Vicksburg with a big squadron in '62, making the voyage from New Orleans through hostile waters without pilots, the water being exceptionally high. When the time drew near for the fleet's return, it proved almost impossible to secure pilots, for the river was falling rapidly. The river men, fearing that the least mishap to ships under their guidance would be interpreted as the result of treachery and would result in their death, refused to volunteer. Farragut himself was afraid to risk the down trip without expert steersmen. The trip north from New Orleans had been marred by several disasters, the sloop of war *BROOKLYN* grounding below Natchez Island and another ship running ashore on the blind side of an island. This vessel was only liberated by a big towboat which hammered against her stern until she floated. A third ship ground-

ed off Cole's creek above Natchez, losing her anchors and chains. These still lie rusting in the mud at that point, for five yoke of oxen failed to drag them forth.

Reports that the Confederate ram *ARKANSAS* was coming out of the Yazoo river to look for battle did not reassure Farragut, this dreaded craft being armored with railroad iron which made her more than a match for his wooden ships. So he sent Captain Frank Richardson of Covington, Ky., to search for navigators. Richardson in turn enlisted Captain Henry Jones and Captain Thomas Sherlock of Cincinnati in the task, but they were unsuccessful, every available pilot refusing to run a blockade of more than 400 miles between Vicksburg and Memphis.

At this time Pilot Harrison was guiding the course of a commissary boat running to Shiloh, having transferred to her from *SUNNY SOUTH*. Reaching the scene of Grant's victory over Albert Sidney Johnston, he found orders awaiting him to take the craft to Memphis, just captured. Here food was distributed from the stores on board to the soldiers. Harrison now returned to Cincinnati, where several army officers, hearing of him from Captain Thomas Sherlock, asked him to come to the aid of Commodore Farragut. The intrepid seafighter had ventured as far as the mouth of the Yazoo river, in spite of the menace of *ARKANSAS* and her railroad armor; but common sense prevented him from risking his ships over the rest of the voyage without qualified pilots.

When Harrison heard of the Commodore's plight he instantly volunteered to lend his services. "It took me but a few minutes to get ready," he says, "although I did not have to go until the next day. My family lived too far away for me to pay them a farewell visit, so I put in the time hunting for more pilots. Only two consented to go. These were my brother, Henry B. Harrison, now deceased; and Joseph B. Dickerson, son of the great pilot of 1830. Going on to Louisville, we picked up two more volunteers, coal pilots named Brown and Seymour. The latter was a member of the crew of the ill-fated *MISSISSIPPI*, destroyed the next year. The five of us sailed on *FOREST QUEEN* for Memphis, which was as far as any

steamboats could safely run. From there we travelled on a little trading-boat, using passports from both Grant and Davis.

"We reached Young's point opposite the Yazoo's mouth, at two o'clock on a mid-July morning. Here we found the truth regarding the so-called Grant's canal. This was really built by General Williams, Grant at the time being a thousand miles distant. Five thousand contra-band negroes were working there as we passed.

"When we hailed the flagship that morning, Commodore Farragut received us bare headed and wearing carpet slippers. He was greatly pleased to read the letter from Sherlock and Jones and to learn that we had come to his aid, for his

situation was daily growing more precarious. He had even written to the secretary of the navy that it would probably be necessary to dismantle several ships to keep their guns from falling into the enemy's hands, as the river was falling swiftly and he anticipated

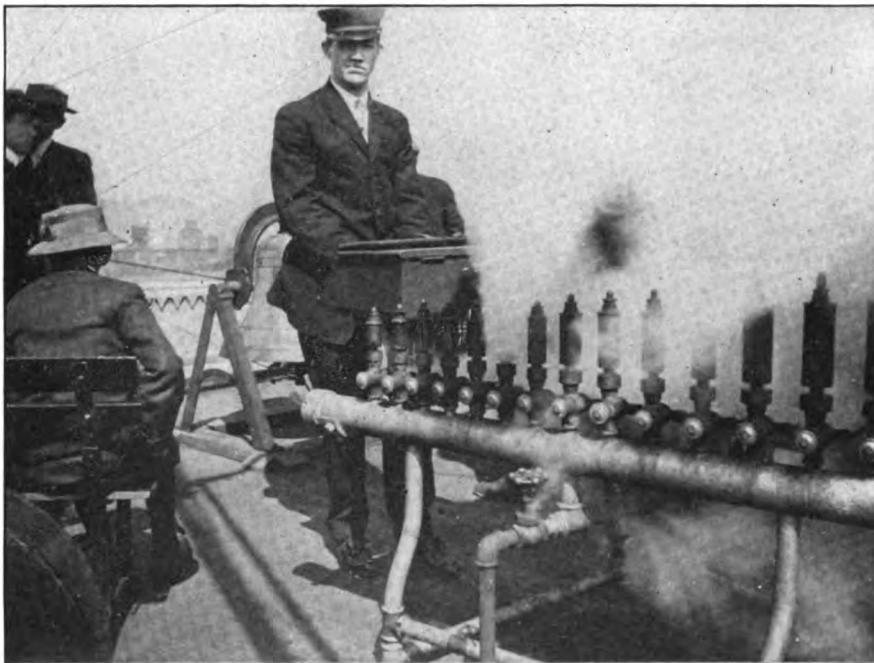
the loss or several of his vessels. The ram ARKANSAS had emerged from the Yazoo and could have destroyed Farragut's whole fleet, had she attempted to do so, her plates making her practically impregnable. But her captain failed to grasp his opportunity,

out mishap. Farragut, well pleased, would have pressed on to Pensacola, but was obliged to wait for orders from Washington. We pilots remained in New Orleans until September, '62, when Farragut went to Pensacola to fit out his fleet. Sent home by way of Brook-

lyn, N. Y., we found ourselves regarded as veritable lions of the hour. To be honest, I must admit we rather enjoyed the experience. Back on the river once more, we found plenty of occupation, dangerous and otherwise, until the close of the war."

In this simple fashion the ancient river mariner tells of the stirring events in which he played a leading role—events which have since provided inspiration for song and story. A visit to the old gentleman

at his home in a Cincinnati suburb is more than worth while to one interested in the story of the great days of river commerce. Those days seem to have gone forever, and the sturdy pilots whose exploits made them memorable will have vanished too in a little while.



"DON'T YOU HEAR THAT STEAMBOAT 'ROUND THE BEND?—"

and Admiral David Porter, in command of the Union vessels on the upper river, soon dispatched the armored gunboat Essex to protect Farragut's rear. When she arrived, the fleet, with the new pilots, went on to New Orleans. All the naval ships were taken through with-

Pure Water Problem on Lake Ships

An Open Letter to the Editor from H. Penton

RECENT outbreaks of typhoid have re-directed attention to the problem of providing pure water for the vessels on the Great Lakes.

In one case in particular, it was declared that the presence of typhoid must have been due to infection from one of the crew, because every care had been taken to ensure clean tanks. It seems almost unnecessary to point out that no amount of care as to tanks will avail if the source of supply and means of distribution are not equally well looked after.

First must be considered the source of supply. This includes not only the locality from which water is taken, but also its introduction into the ship.

Without doubt many lake ships follow routes entirely within areas shown by the report of the international

commission to be either grossly polluted or unsafe; but by far the greater number of ships on the Great Lakes traverse extensive areas free from pollution of any kind. These areas, as worked out by the writer from the report of the commission, even in advance of its appearance and amplified to provide for wind influences, were published in *The Marine Review*, March, 1914, and afterwards recommended by the lake carriers association. For convenience of reference they are reproduced as follows:

Lake Superior

Duluth to abreast Two Harbors and with or after southwest to northwest winds Duluth to abreast of Sand island.

Soo River and Approaches

Whitefish point to abreast Spectacle reef.

Lake Michigan and Straits

West or south of a point at least twelve miles off Milwaukee on Pt. Betsey course. With south to northwest winds twenty-five miles off Milwaukee. Beaver island to Spec-

tacle reef. If following west shore, at least ten miles off shore. With fresh southeast to northeast winds water may be taken under necessity only, between Milwaukee and Chicago not less than ten miles off shore.

Lake Huron

Fifteen miles outside Ft. Gratiot light. With or after strong west to northwest winds Pt. Aux Barques to St. Clair river unless at least ten miles off shore.

River and Lake St. Clair and Detroit River and Approaches

Fifteen miles above Ft. Gratiot light to twelve miles east of Southeast shoal lightship. With or after brisk southwest to northwest winds to twenty-five miles east of southeast shoal.

Lake Erie

Entire westerly end of Lake Erie to east of southeast shoal, as above. Pt. Abino to Buffalo. At least six miles off south shore and with or after south to southwest winds at least twelve miles. Area south of a line drawn from Kelley's island to twelve miles off Erie is unsafe at any time.

It will be observed that Lake Ontario is not included, the fleets for which this information was compiled not trading below Buffalo.

As regarding the intake on the ship, it seems obvious that no matter how

carefully a locality is chosen, no security exists if the supply is drawn through an opening which has been exposed to pollution, as in a harbor, even after the vessel has been several hours under way, and though large quantities of pure water may have been taken in. The remedy is apparently sterilization, but the difficulty of this method with the usual arrangement of seacocks is evident. The alternative seems to be a small isolated seacock, merely large enough for the single purpose of water supply, and arranged so that it can not only be used for no other purpose, but can be thoroughly sterilized before using.

Use of Steam Indicated

The obvious and convenient means is by steam, but in order to apply this means successfully it must be possible not only to raise the temperature of the water at the opening, but actually to reject it altogether. This necessitates a steam connection of liberal proportions and also an opening as small as consistent with the quantity of water to be handled in the time available. With possibly a very few exceptions it will be found that a 1¼-inch opening with a ½-inch steam connection between cock and sea is ample. Even at deep loads it will be found that the steam jet will expel all the water from the fitting and thoroughly sterilize it.

It is recommended that the opening be fitted just above the winter light water line. It will then require no attention in laying up. The fittings between cock and side of ship should be of brass, as the effect of a steam jet in contact with water is to set up active corrosion. The sea cock should be fitted with a lever handle and arranged to be locked up in its closed position. The only key should be in the possession of the master, who will determine when and where water is to be taken and send the key to the person in charge of the pump.

It remains to exercise care as to location of sea-cock with reference to soil-pipe openings, etc. We have gone to the expense of shifting these so that none remain on the same side of ship as the fresh water intake.

It is true that the entire skin of the ship is perhaps liable to contamination and that impurities may find their way into the supply from that source, but I believe that the danger, if it exists, is not great, and that the chief risk lies in dead openings, pipes and the like.

The second consideration is distribution. It follows that if the entry is clean and the locality is always properly chosen, there can be no

pollution inboard, provided that the system is entirely isolated. In the systems the writer has installed there is no opening nor connection of any sort except to the tanks. A 1-inch galvanized line is run from the pump to a convenient point on deck and water distributed to the various tanks. We have preferred to do this by 1-inch hose rather than run additional pipe lines throughout the ship. This hose cannot be used for anything else because it will fit nowhere except the one place. Similarly, the usual deck hose will not fit the fresh water connection. This may not be the best arrangement for all cases, but it has worked out very well.

A small, single steam pump is provided, which is connected only to the fresh water sea cock and delivers only to the tank line. The installation complete, from the side of the ship to the tanks, costs, with 300 feet of hose, about \$125.00 per ship. In each case the entire work was done by the ship's own force. Two years' experience has developed no shortcomings; and what is even more remarkable, the master's report without exception shows there has not been one call on the medicine chest nor one complaint of sickness. The water taken in the specified areas appears as perfectly clear as any spring water. As a further precaution, however, the tanks are treated once a month to a strong caustic solution which is drained away through the service pipes, thereby sterilizing them also.

I consider the matter of tankage to be fully as important as those of supply and distribution. Unless the supply is ample for the business of the ship while traversing impure areas and for stays in port, all other precautions go by the board. Water costs nothing, and a 500-gallon tank costs but little more than a 300-gallon one.

The distribution system used is the same in either case. I have therefore provided tankage on the basis of about 10 gallons per man per day for 12 days. This will be found ample, even in hot weather, to take a ship from Lake Huron to Buffalo and return to Lake Huron and allow of a protracted stay in port. Toilets are not connected to the tanks, but are supplied by an independent system. Baths, lavatories, galleys and drinking fountains all draw from the tanks.

For ships of extreme length it will probably be found cheaper, as well as more desirable, to install separate systems in each end of the ship than to run pipe lines the full length of the vessel or to provide and handle the length of hose required. If pipe

lines are run I should still consider the use of a shot of hose desirable, in order to wash out the rust which will form to some extent, even in galvanized pipe and for washing out the tanks.

Ships whose routes lie entirely within polluted or suspected areas must, I suppose, depend either upon shore supply, which may or may not be better than that along their route, or upon distillers. With the continued rapid growth of lake cities and their industries it is probable that before many years the use of the distiller will become general in any event. With it, however, we will merely be exchanging one set of troubles for another.

Lake Superior Commerce

The commerce of Lake Superior during June, as measured by the canals at Sault Ste. Marie, was 8,360,832 net tons. The movement to July 1 was 17,144,134 tons, against 16,850,717 tons to July 1, 1914, an increase of 293,417 tons. Of the total of 8,360,832 tons moved during June, 370,442 tons passed through the Canadian canal and 7,990,390 through the American canal. The summary follows:

EAST BOUND

	To July 1, 1914.	To July 1, 1915.
Copper, net tons.....	18,287	43,272
Grain, bushels	25,514,645	14,389,509
Bldg. stone, net tons..	.....	.....
Flour, barrels	2,601,482	2,302,247
Iron ore, net tons.....	9,113,190	11,072,607
Pig iron, net tons.....	6,241	.....
Lumber, M. ft. B. M..	144,374	137,745
Wheat, bushels	45,878,817	34,688,112
Unclass. frgt., net tons.	87,056	94,250
Passengers, number ...	5,779	4,671

WEST BOUND

Coal, anthracite, net tons	702,339	678,852
Coal, bituminous, net tons	4,038,690	3,022,437
Flour, barrels	517	100
Grain, bushels .....	.....	31,250
Mfctd. iron, net tons...	96,178	75,205
Iron ore, net tons.....	.....	.....
Salt, barrels	343,194	232,173
Unclass. frgt., net tons.	365,956	326,269
Passengers, number ...	6,759	4,346

SUMMARY OF TOTAL MOVEMENT.

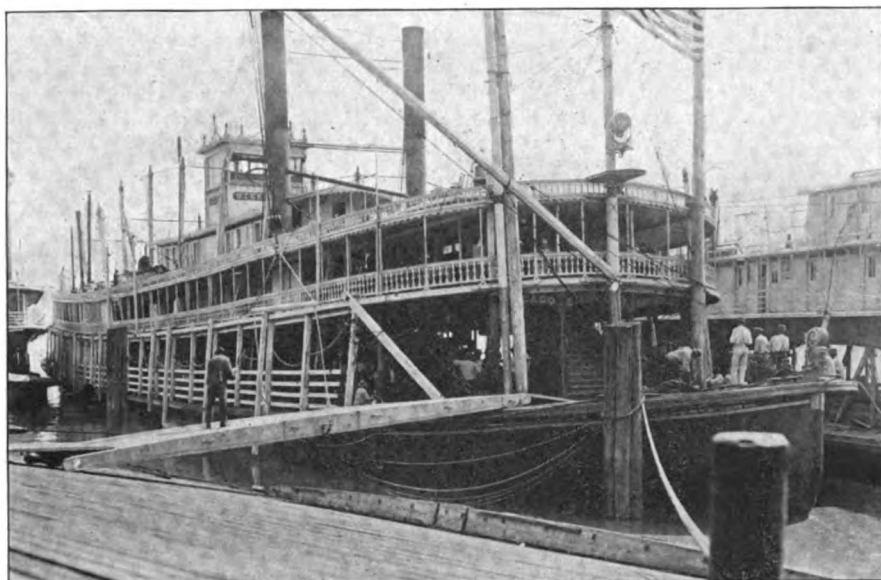
East bound, net tons...	11,596,306	13,006,133
West bound, net tons...	5,254,411	4,138,001
	16,850,717	17,144,134
Vessel passages	5,795	5,576
Registered tonnage, net.	13,012,565	13,811,292

Trial Trip of Tugs

The seagoing tugs GORGONA and TAVERNILLA for the Panama canal, described on page 244 of the July issue of *The Marine Review*, were designed by M. C. Furstenau, naval architect, 308 Walnut street, Philadelphia. These tugs were recently given their trial trip and the results were unusually satisfactory. With steam at 147 pounds per square inch and 25½ inches vacuum, the engines of the TAVERNILLA developed 1,355 indicated horsepower at 105½ revolutions per minute. The speed of the boat was 12.87 knots. The engine is compound, with cylinders 24 and 50 inches diameter respectively, the stroke of each being 30 inches.

Photographs From Far and Near

Contributions for These Pages Are Solicited



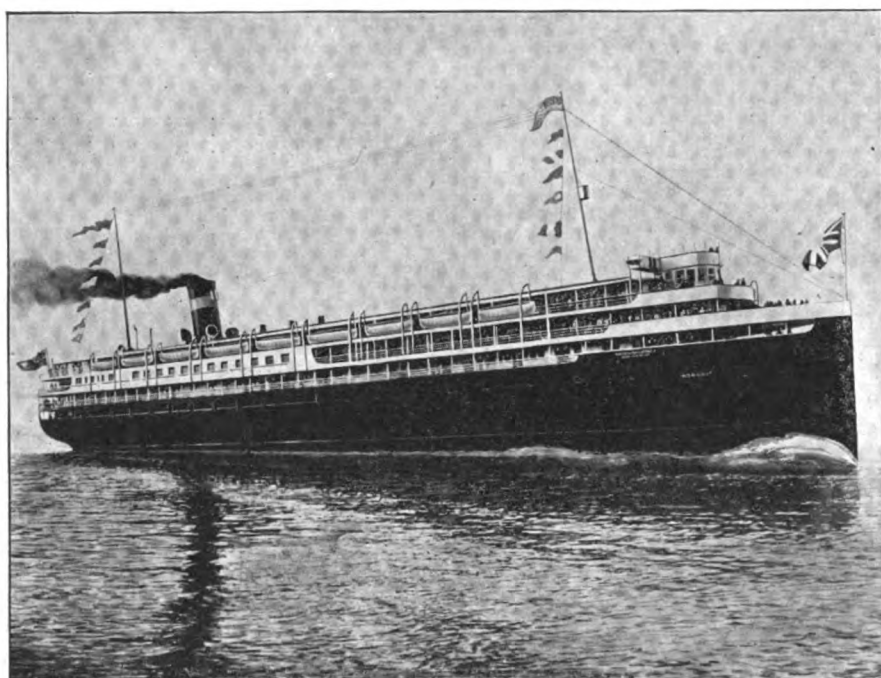
STEEL CITY ARRIVES AT NEW ORLEANS

Through service has been established between La Salle, Ill., and New Orleans via Mississippi and Illinois Rivers. Steel City is in charge of Capt. Hiram Sharpnack. She is 276 feet long and 40 feet beam



WAINWRIGHT TAKING THE WATER
She is 310 feet long and with her turbines delivering 17,000 shaft horsepower will make 29½ knots

Photo by N. Y. Ship Building Co.



STEAMER NORONIC UNDER WAY

Noronic is the latest addition to the Northern Navigation Co.'s fleet of Great Lakes passenger carriers and is now in her second season. She is 385 feet long and was built by the American Ship Building Co.



SPONSOR FOR WAINWRIGHT
Miss Evelyn Wainwright Turpin, of Jamestown, R. I.

Photo by N. Y. Ship Building Co.



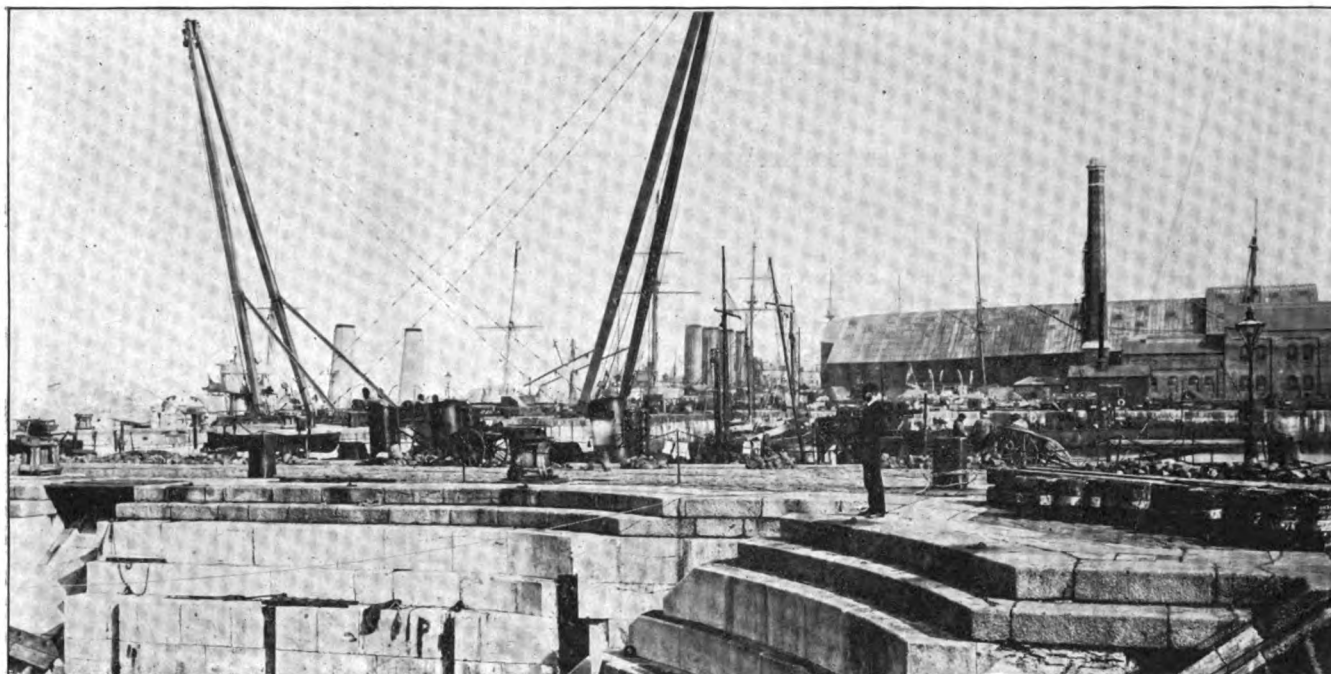
TORPEDO RETRIEVERS FOR U. S. NAVY

Three of a fleet of little power boats used to recover spent torpedoes. Equipped with Sterling engines they make 13 miles per hour

Boston Photo News Co.

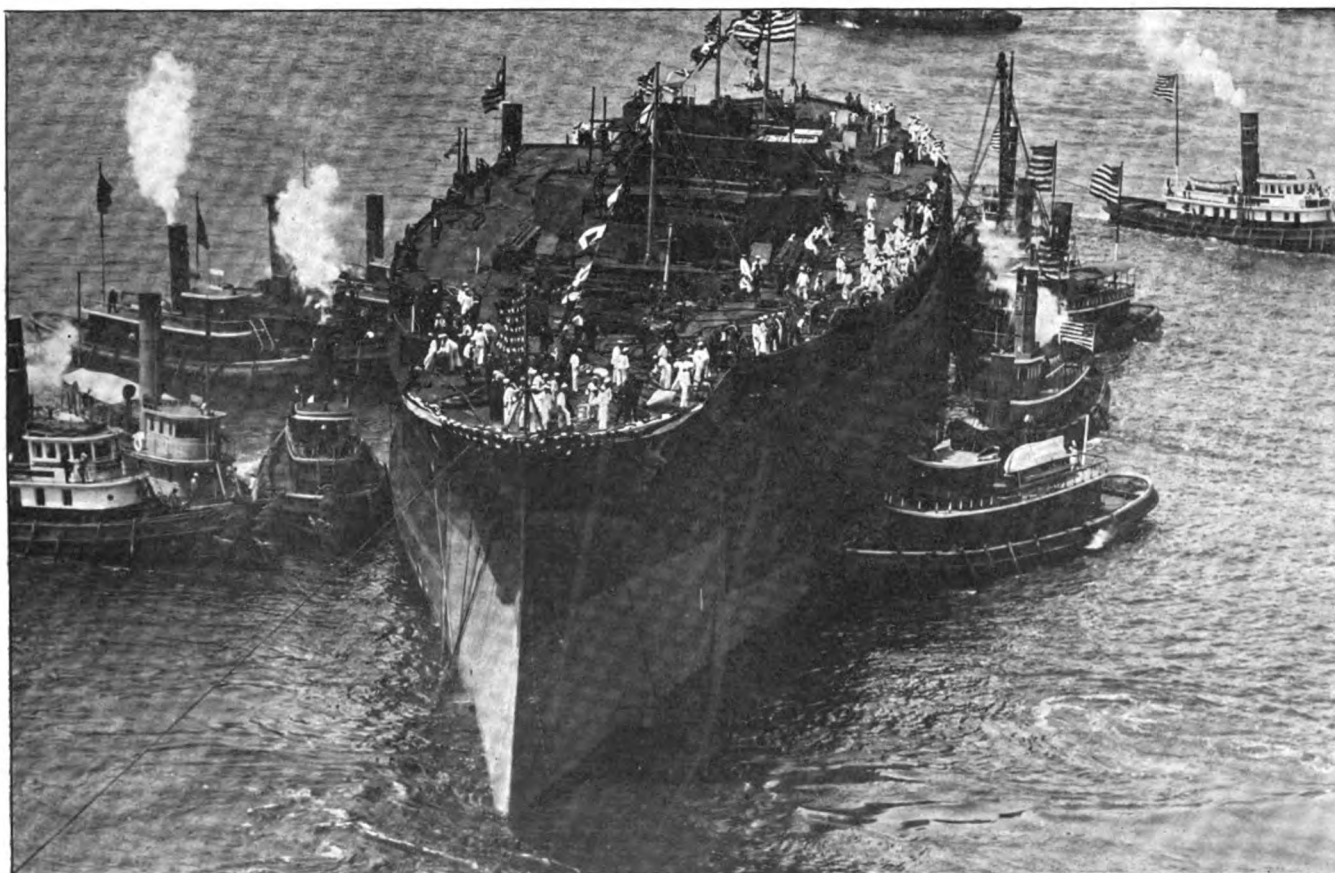
Latest Marine News in Pictures

Payment Will Be Made For Acceptable Photographs



ENGLISH NAVAL DOCKYARD AT PORTSMOUTH

One of the yards maintained for fitting out England's fleet. At present it is the scene of tremendous activity on account of the struggle with Germany



UNCLE SAM'S ARIZONA SUCCESSFULLY LAUNCHED

This photograph of the largest ship in the U. S. Navy was made immediately after the launching at Brooklyn Navy Yard, June 19, 1915
Photo by International News Service

Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

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THE breaking of a bolt in the reversing machinery of a tug, causing a collision, will not release the tug on the ground of inevitable accident, where such bolt had not been inspected for six years.—J. N. GILBERT, 222 Federal Reporter 37.

It was held in the case of LUGANO, 222 Federal Reporter 230, that claims for salvage of merchandise from a vessel wrecked or abandoned at sea may be given priority over the claim of the government for customs duties on such merchandise.

The 40 day harbor rule, applicable to tugs and ferry boats engaged in harbor navigation, making 40 days, rather than a voyage or a season, a period during which general maritime liens shall retain priority, was said in the case of SAMUEL LITTLE, 221 Federal Reporter 308, to be equitable and proper, and should not be abandoned.

A subcharter, even on the same terms as the original charter, does not constitute any contract relation between the subcharterers and the vessel owners, and the charterer cannot recover against such owners for damage to the subcharterer's cargo.—BANES, 221 Federal Reporter 416.

Seamen's claims for wages, which the courts have many times called "sacred claims", are favored in the law of all nations because of the peculiar and perilous service in which they are earned, according to the decision in the SAMUEL LITTLE case, 221 Federal Reporter 308. As a rule, they take priority over other liens.

The decision in the case of Lincoln vs. Cunard S. S. Co., 221 Federal Reporter 622, is authority for the rule that a steamship, using ordinary care and prudence, must so manage discharges of steam and hot water out of an exhaust pipe in the side as not to throw them suddenly and without a warning on the deck of another vessel, in this case, a barge delivering coal, brought alongside at the owner's request, endangering persons engaged thereon in legitimate occupations.

"A tug impliedly represents", according to the case of MASON, 221 Federal Reporter 799, "that she has sufficient power and capacity to safely perform the towing service undertaken by her; that she is acquainted with the channel, the shoals and banks, together with the submerged obstructions; and that she is regardless of the ordinary conditions of the weather and the strength of the tides and currents." It was further held

that a steamer entirely under the control of tugs, her wheel being lashed and her power shut off, has no duty whatever resting on her.

A vessel owner was held, in Kjaer & Isdahl vs. Etier, 222 Federal Reporter 243, not liable for the death of a caretaker placed in custody of the vessel by a United States marshal, caused by falling through the trap in the floor of the fidley leading to the stokehold, it being shown that the owner had exercised ordinary care, and that such caretaker had been employed in such service for several years and was familiar with vessels.

An ordinance of the city of Chicago forbidding vessels to approach drawbridges while a red ball by day or a red lantern by night is displayed in an elevated position thereon, was held, in the case of the City of Chicago vs. Chicago Transportation Co., 222 Federal Reporter 238, not to excuse the city from having bridge tenders on duty, who shall answer a vessel's requests for passageway by giving promptly the information that is appropriate to the occasion.

Recovery by a foreman, employed by a contracting stevedore to load a vessel, for injuries caused by the breaking of a rope sling furnished by the vessel, from the owner, depends, it was held in the matter of the Navigazione Alta Italia, of Turin, Italy vs. Vale, 221 Federal Reporter 413, on whether the rope, when furnished, was reasonably suitable for the purpose. If the defective condition of the rope arose during the progress of the work there can be no recovery.

An interesting quotation is found in the case of TRANSFER No. 12, 221 Federal Reporter 409, where Ward, circuit judge, said: "A vessel of the United States has but one master, viz., the person named in its marine document. Because in small vessels on inland waters the master stands his watch just as the pilot does, it is not unnatural to regard whoever is on duty as master. In large seagoing vessels, however, the master never stands watch. In each case there is but one master, who is not only navigator, but judge of and governor over the whole adventure. He is the master, and the only master, even when asleep in his cabin, while the pilot or other officer, though in charge of the navigation, is not."

Whether a railroad company's tugboat, used in moving freight between different points in New York harbor, was engaged in interstate or intrastate

commerce, and therefore whether redress for an injury to an employe on the boat when tying up at the home dock was within or without the employers' liability act, depends on whether her presence and the act of tying up at the dock constituted the last act in a transaction of interstate commerce or the first act preliminary and necessary to such transaction.—Erie Railroad Co. vs. Jacobus, 221 Federal Reporter 335.

The circuit court of appeals, second district, recently held, in the case of JERSEY CENTRAL, 221 Federal Reporter 625, that where two or more vessels are tied at a pier head in such a way as to interfere with entrance into an adjoining slip, or have swung out with the tide so as to obstruct the fairway, and a dense fog has shut in, and fog signals indicate the approach of another vessel, "there should be sounded some warning of the presence of the obstructing vessels; not navigating or anchored signals, but some other sound, to take the place of sight, whether it be given by beating a pan, or blowing a mouth horn, or using a watchman's rattle or a megaphone."

Under the holding that "property, to be derelict, must be abandoned by the owner without intention to return to the same", Judge Sanborn held, in the recent case of Thompson vs. one anchor and two anchor chains, 221 Federal Reporter 770, that where anchor and chains were lost, and the next day an agent of the owner and an insurance company arranged with a third party to search for the property, such anchor and chains were not derelict. The court also held the services thus rendered were salvage services, and that two sets of salvors, working independently in the search but working together after locating the anchor and chains, were entitled to share equitably in the salvage award, according to the expense incurred and the time expended by each.

In the case of SATILLA, 221 Federal Reporter 949, it appeared that the winch furnished by the ship for the use of stevedores in loading steel rails was defective, the defects being known to the ship and to the stevedores, who furnished the winchman. The rails slipped from the sling, because of a jerk, sinking the lighter. The jerk could have been avoided by the use of a foot lever, with the working of which the winchman was familiar. It was held that the ship was not liable, but the stevedores, using the winch with knowledge of its defects, were held liable for negligence of their employes which caused the mishap.

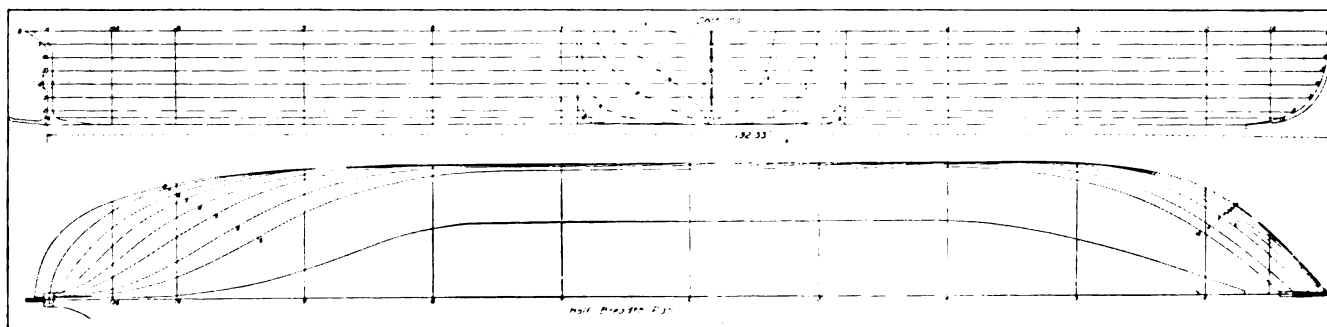


Fig. 1—Showing duplicate of waterline of vessel divided into 10 equal parts with half divisions at the ends and the depth to the 14-foot water line divided into seven equal parts

Isherwood System of Construction

Displacement is the Quantity of Water Displaced by a Body Floating at Rest—The Displacement Sheet

By Robert Curr

DISPLACEMENT is defined as "the quantity of water displaced by a body floating, as rest, as a ship". The following from "Shipbuilding Theoretical and Practical", published in the year 1866, may be interesting for those not quite clear on the subject. "That the weight displaced by a floating body is equal to that of the body and all its contents, may be experimentally proved by apparatus within the reach of every one. Take two vessels, *A* and *B*, as represented in Fig. 2; place one within the other, and fill the upper one with water to the brim; then take another empty vessel, *C*, and lower it gradually into the water in *B*, until it is supported by the pressure of the water. When *C* is at rest, a volume of water equal to that displaced by it has run over into *A*; and if this water be placed in one side of a pair of scales, and the vessel *C* in the other they will be found to balance each other. Replace *C* in the water, and gently drop some heavy material, such as sand or shot into it, and more water will overflow by the introduction of the material into *C*, and, as before the water will balance the vessel and its contents. This may be often repeated, until *C* sinks nearly to its upper part, and it will be found in every experiment that the weight of the

water which has overflowed from *B* is always equal to that of *C*, and of the material it contains, provided great care be taken that none of the water is lost, and that none adheres to the outside of the vessels."

From these practical proofs of the

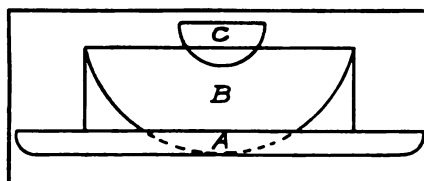


FIG. 2—DIAGRAM OF DISPLACEMENT EXPERIMENT

equality which always exists between the weight of the floating body with its contents and that of the water displaced, we also learn that for every weight put on board of a ship there is an equal weight of water displaced by it.

Fig. 1 shows a duplicate of the water line of a vessel divided up into

ten equal parts, between perpendiculars, with half divisions at the ends, and the depth to the 14-foot water line divided into seven equal parts, the lowest division being divided into half. The principal dimensions of the vessel are as follows:

	Feet.
Length between perpendiculars.....	192.33
Breadth, molded	40.00
Draft, molded	14.00
Water lines, distance apart.....	2.00
Sections, distance apart.....	19.23
Rise of floor.....	0.25

Table I shows the displacement sheet. It deals with the underwater portion of the vessel, below the load water plane, considered as a solid. The molded dimensions are used for this purpose, as shown on top of displacement sheet.

The first column in the table shows the number of sections; second, Simpson's multipliers, and balance to eighth water line, half breadths and products. Over the columns are Simpson's multipliers and water lines.

The half breadths of the water lines, the intersection of water line and section, are measured off in feet and decimals of a foot, and placed in rows, as shown by the black face figures opposite the numbers of sections in the first column of Table I. All the half-widths in the columns are multiplied by Simpson's multipliers, shown in the sec-

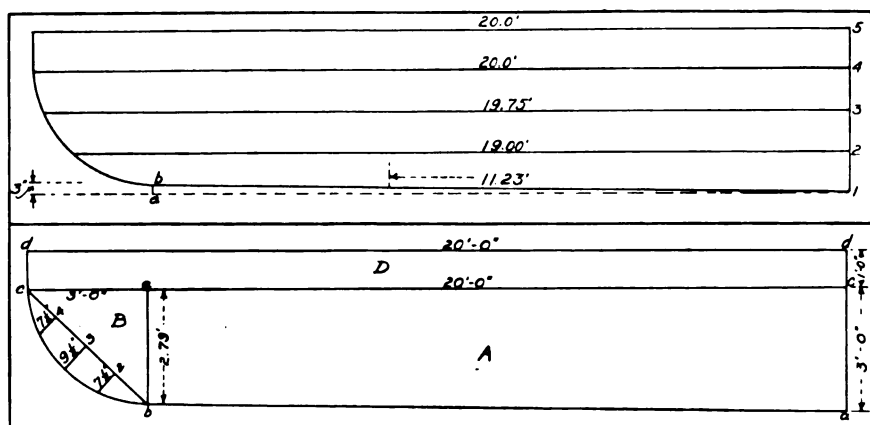


FIG. 3—TRIANGLE ABL SHOWS RISE OF FLOOR
FIG. 4—DIAGRAM SHOWN IN FIG. 3 SUBDIVIDED

This is the twenty-fifth of a series of articles on the Isherwood system of construction which began in the September, 1912, issue of *The Marine Review*.

Table I.

Displacement in tons = $2,419.32$
 $978,709.66$

$$\frac{978,705.00}{\quad} = 95.5 \text{ ft. C. B. abaft stem.}$$

67.493.52

$$\overline{3128.2}$$

UNIVERSITY OF MICHIGAN

Area of segment, sq. ft..... 2.19

Half Year Record of Lake Accidents

Many Casualties Caused by Grounding, Fire and Disabled Steering Gear—Three Total Losses Reported

THE ACCOMPANYING table is a summary of accidents which have occurred on the Great Lakes and connecting waters from Jan. 1 to July 1, 1915. Analysis of the table shows that practically half of the accidents listed were caused through vessels grounding, stranding or running ashore, while fire, collision and disabled steering gear were other notable causes of damage.

Three vessels are reported as total losses, the steamers IOWA and BEAVER and a dredge. The most important loss of the season up to July 1 was the steamer IOWA, of the Goodrich Line, which was sunk in an ice jam off Chicago harbor on Feb. 4, carrying down a cargo of general merchandise valued at \$200,000. She was abandoned by the underwriters as a constructive total loss and was insured for \$60,000. It is reported that attempts may be made later to save her. The steamer BEAVER, valued at \$10,000, was destroyed by fire

at Charlevoix, Mich. A dredge towed by the tug S. C. DIXON, foundered in heavy weather on Lake Huron on May 16.

Five lives were lost, four on the sandsucker JUNIOR, which hit the breakwater at Cleveland on May 9 and sank, and one through the explosion of a gas tank on the steamer THOMAS WALTERS at Duluth on June 30.

Two serious collisions occurred, the first between the steamers A. W. OSBORNE and VALCARTIER on May 13 and the second between the steamers CHICAGO and J. B. EADS on June 7. The OSBORNE and VALCARTIER collided head-on in a heavy fog in Lake Huron abreast of Corsica Shoal lightship, necessitating the docking of both vessels and throwing VALCARTIER out of commission for a month. The cost of repairs to VALCARTIER was approximately \$15,000 and the damage to her grain cargo was estimated at \$125,000. The CHICAGO-EADS collision occurred in the St. Clair

river when the steamer CHICAGO crashed into the stern of EADS, damaging her shoe and wheel and denting a hole in her stern above the waterline. She was towed to Lorain and docked and was fitted with a new rudder stock. The Pittsburgh Steamship Co., owner of the steamer EADS, has filed a libel against CHICAGO for \$19,000 damages, claiming \$15,000 for repairs and \$4,000 as compensation for the loss of time suffered by the steamer. The Chicago was docked at Buffalo and her repairs estimated at \$5,000.

The Canadian steamer STRATHCONA met with a serious accident when she stranded in the St. Lawrence river on May 29. She was docked at Buffalo and incurred a repair bill of \$22,500. The steamer TUSCARORA hit the waterworks crib off Chicago on June 3, carrying away the masonry superstructure of the crib. The vessel was docked at Buffalo. Repairs to TUSCARORA necessitated the expenditure of \$20,000.

Accidents to Lake Vessels for First Half of 1915

Date.	Name of Vessel.	Nature of Accident.	Place.
Jan. 7	Str. J. S. Ashley	Slightly damaged by fire which started through an accumulation of waste in after end.	Buffalo.
.....	Str. Geo. N. Orr	Slightly damaged by fire.	Depot Harbor, Ont.
Jan. 14	C. F. Ashtabula	Two buckets knocked off wheel by ice pack; docked at Ashtabula in March, receiving four new propeller blades and a new hub. Repairs completed March 31.	Lake Erie.
Feb. 4	Str. Iowa	Sank in heavy ice jam; abandoned by underwriters as total loss; insured for \$60,000. Effort will be made to save her cargo of general merchandise valued at \$200,000.	Off Chicago harbor, Lake Michigan.
Feb. .	Str. Samuel Mather	Grounded when water dropped 5½ feet; coal cargo taken out and floated Feb. 6; No. 3 and 4 tanks punctured.	Lackawanna Slip, Buffalo.
Feb. .	Str. Thomas Barlum	Grounded owing to low water; No. 3 tank punctured; cargo taken out and docked Feb. 17; 7 plates taken off.	Buffalo.
Feb. .	F. C. Pere Marquette 19	Damaged her shaft in the ice and was docked at Milwaukee Feb. 10.	Lake Michigan.
Mar. .	Str. R. W. England	Fire started in her coal cargo, but resulted in no damage.	Milwaukee.
Mar. 19	Tug Minnesota	While bucking ice, split her wheel and later lost it entirely.	Duluth-Superior harbor.
Mar. 22	Str. Byron Whitaker	Damaged by fire.	Trenton, Ont.
Mar. 22	Str. J. S. Ashley	Damaged her bow by striking Louisiana street bridge abutment.	Buffalo.
Mar. .	C. F. Marquette & Bessemer No. 2	Hit a dock, damaging her port quarter.	Conneaut.
Apr. 2	Str. Sir Thos. Shaughnessy	Damaged by fire which started in her coal bunkers; not seriously damaged.	.....
Apr. 9	Str. Topeka	Seacock was left open and steamer settled on bottom; raised after several days.	Kinnickinick river, Milwaukee.
Apr. 16	Str. Calcite	Hit coal dock across the head of the Middle Ground, dropping 500 tons of coal into river and damaging dock to extent of \$3,000.	St. Clair river.
Apr. 19	Str. Paliki	Ran ashore; released after lightering 100 tons; reloaded lightered cargo and left for Chicago.	Simmon's Reef, Lake Mich.
Apr. 19	Str. Dunelm	Stranded at entrance to harbor; released and docked at Collingwood, Ont., on April 20; nine plates damaged.	Collingwood, Ont.
Apr. .	Str. N. F. Leopold	Steering gear became defective, delaying steamer for a day.	Lake Michigan.
Apr. 20	Str. J. Frater Taylor	Ran ashore, forepeak filling with water; released and docked at Port Arthur, Ont.; bow crushed in below water line, 15 plates damaged, and part of forefoot gone. Grain cargo was transferred to steamer Martian. Floated out of dry dock May 10.	Blake Point, Isle Royale, Lake Superior.
Apr. .	Str. St. Clair	Ran aground; released.	Lake St. Clair.
Apr. 21	Str. Beaver	Destroyed by fire; loss, \$10,000.	Charlevoix, Mich.
Apr. 23	Str. James Corrigan	Ran aground; released after lightering 10,000 bushels of grain; reloaded lightered cargo and proceeded.	Sweet's Point, Soo River.
Apr. 23	Str. W. A. Rogers	Ran on bottom; released on April 24 after lightering 10,000 bushels of grain; reloaded lightered cargo and proceeded.	Grosse Point, Lake St. Clair
Apr. 23	Str. G. A. Tomlinson	Ran aground.	Lake St. Clair.

(Continued on following page.)

Accidents to Lake Vessels for First Half of 1915

(Continued from preceding page)

Date.	Name of Vessel.	Nature of Accident.	Place.
Apr. ..	Str. Glenlyon	Ran aground; raised on April 23 and went to Windsor; slightly damaged.	Detroit river.
Apr. 24	Str. D. Z. Norton	Ran aground; released.	St. Clair Flats canal.
Apr. 25	Str. Collingwood	Ran aground owing to low water; released on April 26 by tug and lighter; rudder badly bent and was sent to Great Lakes Engineering Works to be repaired; reshipped rudder on April 30. Docked later at Buffalo.	Corsica Shoal, Lake Huron.
Apr. 25	Str. F. B. Wells	Ran aground on east bank below the cut; released after lightering 600 tons hard coal; reloaded lightered cargo and proceeded.	Detroit river.
Apr. 25	Str. F. B. Jones	Ran ashore; released; No. 4 tank leaking.	Braddock's Pt., Lake Ontario
Apr. ..	Str. Winona	Ran ashore; released after lightering; docked at Quebec May 7.	New Sister Isl. lighthouse, St. Lawrence river.
Apr. ..	Str. Ellwood	Ran aground.	Near Duluth entry.
Apr. 29	Str. Key West	Ran aground; released after jettisoning about 400 bushels wheat.	Niagara river.
Apr. 29	Str. Glenmavis	Struck Gridley's boat house, doing considerable damage.	Midland, Ont.
Apr. 29	Str. Glenfinnan	Ran aground; released May 1 after lightering; reloaded lightered cargo and left, leaking slightly.	Vidal Shoals, near Canadian Soo.
Apr. 30	Str. Glenmount	Ran aground; docked at Kingston for repairs; 27 plates had to be taken off.	St. Lawrence river, near Round Island.
.....	Str. Mapleton	Struck and punctured No. 1 tank; docked at Ashtabula May 11; two plates damaged.	Port Dalhousie, Ont.
.....	Str. N. F. Leopold	Struck after taking on a cargo of stone; four plates damaged.	Calcite, Mich.
May 1	Str. Anna C. Minch	Rammed approach to Northern Pacific bridge, temporarily blocking traffic. Steamer not injured.	Superior, Wis.
May 3	Str. Wyandotte	Ran aground; released on May 4.	Grosbe Pt., Lake St. Clair.
May 3	Str. Kinmount	Struck and damaged barges Power and Rutherford.	Lachine canal.
May 4	Str. Rosemount	Carried away lock at Cote St. Paul.	Lachine canal.
May 5	Str. H. P. Bope	Ran aground on soft bottom; released herself, uninjured.	Portage Lake.
May 6	Str. W. E. Corey	Struck, owing to low water; No. 2 tank on starboard side punctured and bottom damaged; left the Soo on May 8 after making temporary repairs; docked at Lorain May 16 and repairs completed May 22; nine plates damaged.	Davis canal, Soo.
May 6	Str. Helen C.	Grounded owing to low water; released herself on May 18 and resumed her trip.	Thunder Bay river.
May 8	Bge. Aurora	Damaged by fire, said to have resulted from an overheated boiler; damage estimated at \$500.	Toledo.
May 9	Sandsucker Junior	Hit breakwater and sank, drowning four of crew; raised May 20 and docked at Cleveland; badly damaged, boiler rolled out.	Cleveland.
May 10	Str. F. L. Robbins	Ran aground; released, and unloaded coal cargo at Green Bay; repaired at Superior June 5; eight plates damaged.	Long Tail Point, Green Bay.
May 11	Str. Robert Holland	Upper works destroyed by fire; will be rebuilt.	At dock, Sturgeon bay, Wis.
May 12	Str. Nyanza	Collided with a mud scow; 5-foot hole stove in her port bow; docked at Buffalo and repairs completed May 27.	While leaving Welland canal, Port Colborne.
May 12	Str. W. S. Mack	Grounded; released by tug.	Illinois Central Slip, Chicago
May ..	Str. Kensington	Grounded, owing to low water; released.	Near Ludington, Lake Mich.
.....	Bge. Santiago	Grounded (in tow of Str. Kensington).	Near Ludington, Lake Mich.
May 12	Str. Philip Minch	Ran aground on east side of island in thick fog; released on May 13 after lightering; reloaded lightered cargo and left; slightly damaged.	Pelee Isl., Lake Erie.
May 13	Str. A. W. Osborne	Collided with Str. Valcartier in dense fog and beached in 19 feet of water; released and temporarily repaired at Port Huron, where she left on May 15; docked at Cleveland, 14 plates taken off bow and damaged stem repaired; repairs completed June 8.	Abreast Corsica Shoal Light-ship, Lake Huron.
May 13	Str. Valcartier (nee W. H. Mack)	Collided with A. W. Osborne, head-on, in dense fog; settled on bottom after reaching Port Huron; temporarily repaired, pumped out on May 23, and half of her grain cargo lightered; damage to grain cargo estimated at \$125,000 and cost of repairs at \$15,000; left Port Huron June 3; docked at Collingwood, Ont.; 15 plates damaged; total time lost by vessel on account of accident was one month.	Abreast Corsica Shoal Light-ship, Lake Huron.
May 15	Sch. City of Sheboygan	Nose cut off by Str. McWilliams which crossed her course; arrived at North Tonawanda in crippled condition on May 19.	Lake Erie.
May 16	Tug S. C. Dixon	Began leaking and was beached at Point Lookout.	Lake Huron.
May 16	Dredge (In tow of tug S. C. Dixon)	Foundered in heavy weather; crew rescued.	Lake Huron.
May 17	Tug Sarnia City	Struck a rock and sank.	St. Clair river.
May 17	Str. W. H. Wolf	Broke rudder stock while going to elevator; repaired at Chicago.	Chicago.
May 18	Tug Erastus Day	Caught between Str. Cort and dock and upper works badly jammed. Repaired at Conneaut.	Conneaut.
May 20	Str. J. H. G. Hagarty	Ran aground; released by tug.	Lake St. Clair.
May 20	Bge. Viking	Sank while at dock; floated on May 29 by wrecker Favorite; repairs completed at Toledo June 4.	Maumee river, Toledo, O.
May 22	Bge. J. I. Case	Ran aground when tow line parted; lightered.	Niagara river.
May 22	Str. Lewiston	Collided with Str. Delaware; bow damaged; docked at Buffalo.	Detroit river.
May ..	Tug Princeton	Steamer Delaware will not have to be docked.	Buffalo creek.
May ..	Tug Princeton	Picked up log in her wheel and broke main shaft; went to Cleveland for repairs.	Buffalo creek.
May 26	Str. E. H. Gary	While shifting was caught by current and struck four other steamers.	Escanaba.
May 26	Str. Fulton	Hit by Str. E. H. Gary; several plates cracked.	Escanaba.
May 27	Str. Clifford F. Moll	Because of inadequacy of turning basin, steamer became wedged between another vessel and dock; bow of the Moll crushed into Str. Stewart and her stern into Anchor Line freight house; considerable damage done to the Moll.	Buffalo.
May 27	Str. Stewart	Hit by Str. Moll while she was in turning basin; several plates damaged; struck again by Str. Robbins on June 5; damage not serious.	Buffalo.
May 27	Ferryboat Niagara Frontier	Steering wheel jammed, vessel drifting helplessly until rescued by tug and towed to dock.	Niagara river.
May ..	Str. LaSalle	Hit a dock; repaired at Superior shipyard.	Knife river.
May 27	Bge. Tokio	Sprang a leak while out in a heavy sea and sank in channel off Cedar Point; pumped out and floated June 2; 500 tons coal taken off by another vessel.	Lake Erie.
May 28	Str. Indus	Struck in river on line with Sixteenth street bridge.	Chicago river.

(Continued on following page.)

Accidents to Lake Vessels for First Half of 1915

(Continued from preceding page)

Date.	Name of Vessel.	Nature of Accident.	Place.
May 28	Str. Arizona	Broke her wheel and sustained damage to her stern in backing out of Pennsylvania slip; crashed into dock; will have to go into dry dock for repairs.....	Buffalo.
May ..	Str. A. E. Ames.....	Damaged; will be repaired at Kingston.....	Welland canal.
May ..	Str. C. A. Jacques.....	Struck in river; docked at Ashtabula; 29 plates damaged.....	St. Lawrence river.
May 29	Str. Ionic	Broke her stern frame; will be repaired at Montreal.....	.....
May 29	Str. Strathcona	Ran ashore; had to lighter; leaked in forepeak and No. 1 port and starboard tanks; docked at Buffalo June 8; 30 new plates put on; damage estimated at \$22,500.....	Near Quebec, St. Lawrence river.
June 2	Str. Rockefeller	Hit carferry Marquette & Bessemer No. 2; slightly damaged..	Conneaut.
June 2	Carferry Marquette & Bessemer No. 2.....	Hit by Str. Rockefeller; several plates above water line damaged	Conneaut.
June 3	Str. Panay	Anchor caught and broke cable at life saving station.....	Chicago.
June 3	Str. Chas. McVea.....	Engine went through itself two miles off Chicago; towed to Benton harbor for repairs.....	Lake Michigan.
June 3	Str. Bennington	Stern of steamer hit Eighteenth street bridge tender's house, doing considerable damage.....	Chicago.
June 3	Str. Tuscarora	Hit waterworks crib in fog; stem twisted down to forefoot and leaked; put back to Chicago, where she was temporarily repaired; docked at Buffalo June 10; new stem put on and 34 plates replaced; repairs completed June 25 and estimated at \$20,000. Masonry superstructure of crib carried away.....	Lake Michigan, off Chicago.
June 3	Str. Peter White	Steering gear became disabled, causing her to strike bank and damaging a dozen plates; docked at Ecorse June 5 for repairs	St. Clair river.
June ..	Bge. Jenney	Two plates on bow damaged in jam at the Soo; went to Superior ship yard for repairs.....	Soo, Mich.
June 7	Str. South American.....	Ran ashore; released and proceeded, but grounded again on Middle Ground, St. Mary's river; released by tugs; docked at South Chicago June 13; four plates off and considerable other damage	Nr. Nine Mile Pt., Hay Lake
June 7	Str. Chicago	Crashed into stern of Str. Eads; stem badly twisted and hole punctured in her bow; temporarily repaired at Ecorse; docked at Buffalo; five new upper plates put in and all frames 25 feet back from stern were replaced; repairs completed June 24 and estimated at \$5,000.....	St. Clair river.
June 7	Str. J. B. Eads.....	Collided with Str. Chicago; shoe and wheel damaged, rudder post badly bent and hole in stern above water line; towed to Detroit and from there to Lorain where she was docked on June 10; new rudder stock put on and nine deck and 12 shelf plates renewed.....	St. Clair river.
June 9	Str. Nyanza	Grounded while going out; released, uninjured.....	Buffalo.
June 12	Str. Stephenson	Ran ashore in thick fog; Bge. Roebing (in tow) ran into her stern; 12 plates and 8 frames damaged; repaired at South Chicago	Mackinac Island, Straits of Mackinac.
June 12	Bge. Roebing	Ran ashore (in tow of Str. Stephenson) repaired at South Chicago; 6 plates damaged.....	Mackinac Island, Straits of Mackinac.
June 12	Str. Henry Rogers.....	Ran on shoal; released herself.....	Graham Shoal, Lake Huron.
June 14	Str. Martin Mullen.....	Grounded inside the breakwater; pulled off with difficulty by tugs; not damaged	Buffalo.
June 14	Str. Briton	Damaged by fire.....	Racine, Wis.
June 14	Str. Rapids Prince.....	Struck head gate and damaged her stem.....	Iroquois canal.
June 14	Str. Quebec	Collided with Str. Althea.....	Toronto, Ont.
June 15	Scow	Sprang a leak and lost her derrick.....	Lake Erie, off Cleveland.
June ..	Str. E. L. Fisher.....	Two plates cracked; temporarily repaired at Ogdensburg, N. Y.	.....
June 17	Str. Fordonian	Broke her crank shaft; towed to Port Colborne by tug; repaired at Ecorse	Above Whitefish Pt., Lake Superior.
June 20	Str. Alfred Mitchell.....	Rammed Lower Lakes Dock Co.'s dock, damaging it slightly; steamer also slightly damaged.....	Sandusky, O.
June 22	Str. Susquehanna	Jammed by Str. Delaware.....	Erie, Pa.
June 23	Str. Utica	Got a line in her wheel while shifting to Wabash dock.....	Chicago, Ill.
June 25	Str. Frontenac	Log jammed between her wheel and rudder; pintle broken and rudder bent; repaired at Detroit, where she left on June 27; new wheel installed.....	Port Huron.
June 26	Str. Queen City.....	Swung by strong current and hit center pier, pierced large hole on starboard side forward; temporarily repaired at Soo and later at Lorain; 4 plates damaged.....	American lock, Sault canal.
June 29	Str. Tadousac	Ran aground; released and went to Montreal for repairs.....	Murray bay.
June 29	Str. Hemlock	Ran aground owing to low water; released	Bar Point, Lake Erie.
June 30	Str. Thomas Walters.....	Gas tank exploded, killing chief engineer Harry J. Reynolds and injuring two others; after end of vessel badly damaged..	Duluth.

Submarines in Hold of Kangaroo Ship

The French freighter KANGURU, which arrived at New York recently in ballast from Bordeaux to carry a general cargo to France, is the only vessel that was ever constructed to carry submarines in her hold by floating them in through the bow.

Captain Felix Bernard said KANGURU was built in 1912 at St. Nazaire by Schneider & Co., to carry submarines, built by the firm for foreign governments, to their destinations. On account of the

way she takes the submarines on board and puts them out the vessel was named after the well known bounding marsupial of the Australian bush, which carries her little ones in an abdominal pouch till they are able to look out for themselves.

The hold of KANGURU is a hollow space without divisional bulkheads, like bulk carriers on the Great Lakes, and the submarine is floated in by swinging back the lower part of the bow, which is on hinges and is fastened with bolts.

By means of ballast tanks along the side of the ships, the stern and bow are

alternately submerged so that the submarine can be floated in, the bow swung back to place, and the water pumped out at the rate of 600 gallons a minute.

KANGURU has taken a submarine of 650 tons to Rio Janiero for the Brazilian government, and her last trip was to Buenos Aires, where she delivered one on January 4 of the present year for the Argentine navy, and returned with a general cargo to France.

After it floats into the hold and the water has been pumped out, the submarine rests securely on a slip like a dry dock, where it is tightly fastened.

Caisson of New Design for Panama

Depth is 65 feet, Length 114 feet and Extreme Breadth 36 Feet—Will Be Used to Empty Locks for Repair Work

By Day Allen Willey

A CAISSON which exemplifies principles new to marine engineering, arrived at the Panama canal recently, having been towed from the plant of the Union Iron Works Co., San Francisco. With this caisson, any lock on the canal may be emptied in case of leakage, or in case repairs are needed to the gates or other operating mechanism. It was designed by the engineers of the Union Iron Works.

The caisson is designed for interchangeable use at all locks. It has a draught of 32 feet when light, to permit convenient handling through the locks. The lower elevation of the sill at the Pacific end of the Miraflores locks is 50 feet below mean sea level. The tidal fluctuation raises the surface as high as 11 feet above mean level and requires an extreme draught of the caisson, when sunk, of 61 feet. Provision for a proper free-board makes the aggregate depth of the structure 65 feet. To achieve statical stability at various depths of immersion, without undue bulkiness or excessive weight in the different parts, required a special and interesting design, involving no small calculation.



FIG. 1—CAISSON BEFORE LAUNCHING

In form, the bottom of the hull is convex, the ends being pointed, and the sides sloping inward from a maximum width of 36 feet, about 22 feet from the keel, to a breadth of 18 feet at the top. A typical transverse cross section of the structure closely resembles a vertical section through a pear-shaped electric lamp, as shown in Fig. 1.

The horizontal lengthwise sections vary with the inward slope of the sides. In general, they resemble those of an ordinary ship, being flattened ellipses, blunt at the ends to contain the girders and breasthooks by which pressure is transmitted to the vertical sills, or shoulders, on the lock walls. The length between vertical ends is 112 feet, 6 inches, the extreme length, including the timber cushions, being 113 feet 10 inches.

The side walls of the locks carry practically all the static load from the caisson, when it is supporting the water pressure. Accordingly, a number of horizontal decks and end breast-hooks are provided to carry the load to the vertical ends. Through a system of vertical framing, built intercostally and extending from the keel

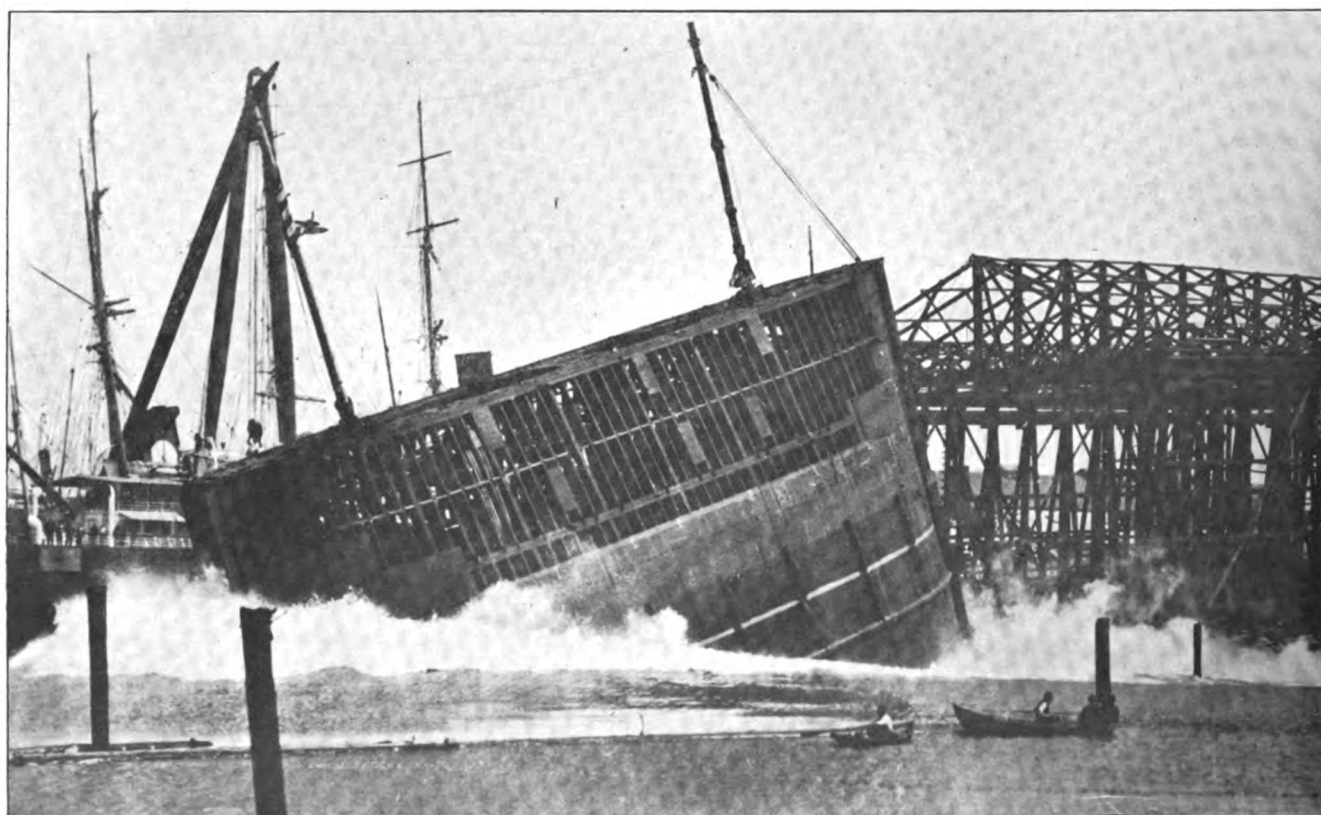


FIG. 2—LAUNCHING THE CAISSON FOR PANAMA CANAL AT UNION IRON WORKS

to the top deck, the panel loading is transmitted to the horizontal decks and breasthooks.

The essential features of the structure are the transverse and longitudinal framing, with bulkheads; the horizontal plate decks, girders and stringers; the girders at the ends along the keel; the end breasthooks; and the plating to cover the skeleton in forming the hull proper. These sections are open hearth steel.

The transverse framing system consists of nine cross frames, spaced about 12 feet apart and extending the full height of the caisson, with intermediate frames, spaced at intervals of about 2 feet, between the main cross frames. All of the frames are built intercostally between the five horizontal decks. A longitudinal bulkhead extends along the center line between the collision bulkheads, from keel to operating deck. The lower part is tight and forms two distinct lengthwise compartments, dividing the free surface of the water ballast and increasing the static stability of the caisson against lateral motion.

Five horizontal decks are built continuously from vertical end to vertical end. The two lower decks, 12 and 25 feet respectively above the base line, are plated over, openings being provided for hatches and manholes. The hatches are large enough to permit the installation or removal of the pumps.

The operating deck, which is 37 feet above the keel, is plated from end to end and is watertight. This deck supports the motors for the pumps, with switchboards, gage registers, etc. The plate-stringer deck, 49 feet above the base line, is an open truss diagonally braced in the center for two-thirds of its length. The top deck, 65 feet

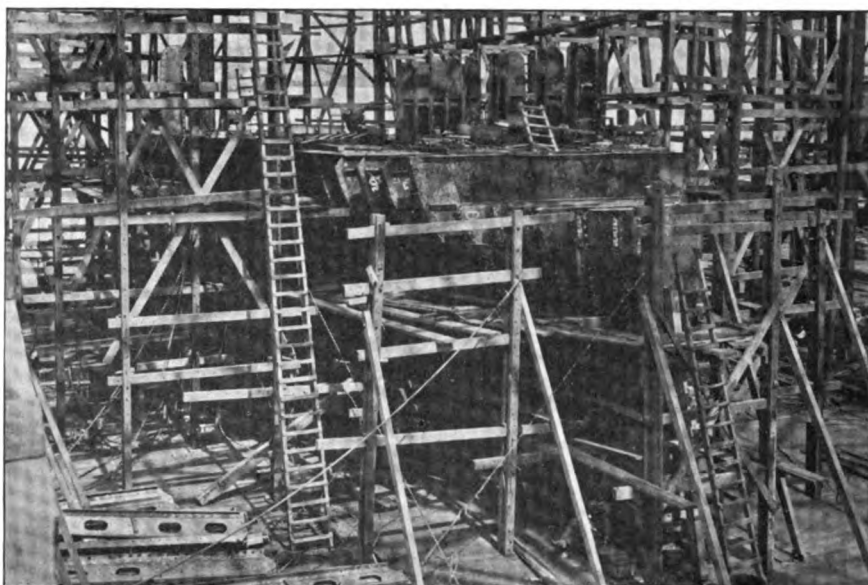


FIG. 4—CAISSON UNDER CONSTRUCTION

above the base, is plated from end to end, with openings for manholes, skylights, deck cranes, companionways and scuppers.

Six breasthooks are built at each stem of the caisson, at intervals between the decks. They serve to transmit the end shears from the decks to the vertical girders. The pumps, installed within the caisson, are designed to regulate the water ballast which determines the depth of immersion, and to unwater any portion of the locks between the upper and lower entrances. Of all the lock chambers of the Panama canal, only the two in the upper flight of Gatun locks can be cleared of water without pumping.

The main pumping system for operating the caisson consists of four vertical shaft, centrifugal pumps, with a 20-inch discharge and 22-inch suc-

tion. They are driven by four 2,200-volt motors. A 220-volt motor is installed for driving an auxiliary pump, and a motor of the same capacity drives a ventilating fan.

Current is received at 2,200 volts from chambers in the lock walls, through four flexible cables. A three-phase transformer is provided for the 220-volt motors and for the lighting equipment. The switchboard is located on the operating deck.

Four portable cranes are located on the top deck. Each crane can raise another at a radius of 14 feet, by two-man power. The pontoon, for making the suction extension attachments, is carried on the top deck and is handled by cranes. There is a deck capstan, hand-operated, at each end of the top deck. The capstan can withstand a pull of 10,000 pounds. Two ventilators, each 16 inches in diameter, with standard type hoods, are placed on the top deck, for ventilating the operating room. They have multivane exhausters and are motor driven. Twelve air vents, each 2 inches in diameter, allow the escape of air and gases from the interior compartments.

Two skylights, 8 x 16 feet, are set in the top deck, symmetrical with the axes of the caisson, and are raised and lowered by a hand-operated device. Fixed ballast, consisting of pig iron and concrete, is carried in the hull of the caisson, to a normal thickness of about 18 inches. The pig iron is at all points 6 inches thick, from the sheathing. Two 70-foot anchor chains are used for mooring the caisson when it is reinforced with concrete at the ends of the operating deck.

The width of the lock chambers is 110 feet, beyond the line of the emer-

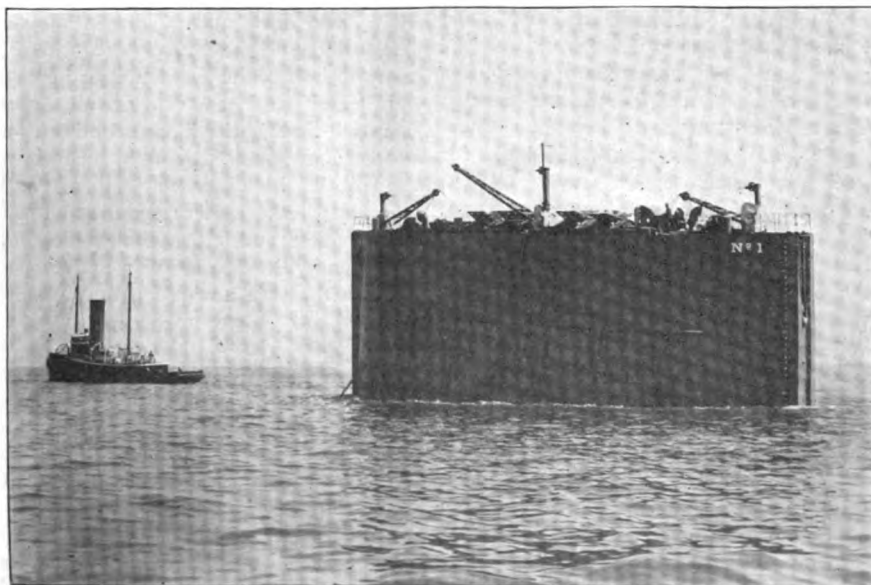


FIG. 3—CAISSON EN ROUTE TO PANAMA

gency dams. The approach is widened by an offset of 24 inches on either side. These shoulders with a connecting horizontal sill across the bottom of the chamber, form a frame in which the caisson is fitted to dam off the interior of the lock. This is accomplished by floating the caisson against the shoulders and sinking it on the

sill. The pumps unwater the chamber, while water pressure from the outside forces the caisson securely against the frame and reduces leakage around the edges.

To remove the caisson, the lock chamber is filled with water, relieving the pressure, and the water within the caisson is removed, making it buoyant.

More Large Vessels Ordered

EIGHT merchant vessels were added during the month of June to the rapidly lengthening list of contracts closed with ship yards along the Atlantic coast. This brings the total for the past six months up to 43.

Two additional steamers were ordered by the Munson Steamship Co. from the Maryland Steel Co., Sparrows Point, Md. The Maryland company now has three Munson boats on the ways. The Munson company also ordered a boat from the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. The Fore River Shipbuilding Corporation, Quincy, Mass., has taken an order for a freighter from the Lukenbach Steamship Co. The New York Shipbuilding Co. has contracts for four more tank boats, including two additional 10,250-ton ships for the Standard Oil Co., one for the Coastwise Transportation Co. and one for the Gulf Refining Co. The latter two are reported to be 10,000-ton boats. The New York Shipbuilding Co. is now building four tankers for the Standard Oil Co.

Some of the boats just awarded call for delivery in 20 to 22 months' time. This fact is sharply illustrative of the congested condition of eastern ship yards. It explains the important plans that are under way for extensions to present plants along the Atlantic coast.

The Fore River Shipbuilding Corporation has just awarded contracts for a large boiler and plate shop and has other enlargements in view. The Maryland Steel Co. is undertaking further improvements at Sparrows Point, whereby it will have another new set of ways for accommodating 650-foot vessels. The Wm. Cramp & Sons Ship & Engine Building Co. has important plans for betterments now taking form, and it is reported it will expend a very large sum in this direction. The New York Shipbuilding Co. also is credited with some improvement plans. These proposals, it is said, are as yet in a formative stage. A large number of new boat propositions continue to be figured upon

by eastern builders. The Bethlehem Steel Corporation, which a year or so ago arranged for a fleet of five 17,000-ton ore carriers, to be built abroad for carrying iron ore from its Chilean mines to eastern ports through the Panama canal, now, it is expected, will be obliged to have these boats built in this country, because of the present position of the foreign plants on account of the war business. The Bethlehem Steel Corporation has made some preliminary moves toward arranging for such construction. W. R. Grace & Co. have completed specifications for a new 6,000-ton steamship of the Colusa type, which will be 378 feet long and have a beam of 49 feet. A number of other inquiries are being bid upon but no single eastern yard finds itself able to figure upon all propositions, and generally the builders are singling out the work desired.

Ships Built Last Year

During the fiscal year ending June 30 1915, 1,226 vessels of 215,711 total gross tonnage were built and officially numbered in the United States, as compared with 1,291 vessels of 311,578 gross tons in the previous year. The principal new craft are two colliers, *ACHILLES* and *ULYSSES*, of 11,081 and 10,910 gross tons, respectively, for the Panama canal trade. Other vessels of more than 5,000 gross tons are *JOHN D. ROCKEFELLER*, an 8,374 gross ton tanker; *GREAT NORTHERN* and *NORTHERN PACIFIC*, of 8,255 gross tons each, built for Pacific coast passenger service; *J. A. MOFFETT*, 6,395 gross tons; and *LYMAN STEWART*, 6,054 gross tons. The latter two, both tankers, were constructed on the Pacific coast. But one large sailing vessel was built during the year, this being *GEORGIA*, a schooner of 1,318 gross tons. In all, 23 vessels of more than 1,000 tons each were built, aggregating 123,242 gross tons.

During this fiscal year, more than two-thirds of the total shipping built came from Atlantic and Gulf yards, aggregating a total of 586 vessels of 166,215 gross tonnage. Of this, 67,573 tons were of wood and 98,642 tons were

of steel construction. This was a marked falling off from the same period of 1914, in which the same sections produced 209,245 gross tons of merchant vessels.

Pacific coast yards launched during this period 345 craft of 34,984 gross tons, equally divided between wood and steel construction. This was practically as large an output as shown in the corresponding period last year. The Great Lakes production fell from 60,695 gross tons in 1914, to 10,248 gross tons for the same period ending June 30, 1915. Of this, 5,756 gross tons were of wood and 4,492 of steel. The western river builders launched 4,137 gross tons of shipping this year, as compared with 6,048 gross tons last year.

The United States in 1915 produced 51 sailing vessels of 7,268 gross tons, and 811 steam vessels of 147,467 gross tons. This proportion is similar to that shown in the preceding 12 months.

During June, 1915, 176 vessels of 16,767 gross tons were added to the United States merchant fleet; 170 of 8,824 gross tons, being of wood, and six of 7,943 gross tons being of steel. Three were of foreign origin, including the German-built steamers *GLENPOOL* and *COMMUNIPAW*, of 5,549 and 3,710 gross tons, respectively and the Scottish-built barkentine *ALTA*, of 1,381 gross tons.

Staff Captain Appointed

Capt. James Harrison has been appointed staff captain of the steamer *NORONIC*, operated on the Great Lakes by the Canada Steamship Lines, Ltd., Toronto.

This is a new departure in Great Lakes passenger service and it is expected that the movement will spread. The staff captain will be subordinate to the master of the vessel and his duties will consist of taking care of the discipline of the crew, supervising boat drills, fire drills and making a complete inspection of the vessel every day in company with the chief steward, purser and chief engineer, visiting all departments including the kitchen, dining room, staterooms, etc. Also in a general way it will be his duty to look after the comfort of the passengers, thus allowing the captain and other deck officers an opportunity to devote their entire attention to the safe navigation of the ship.

Britishers Seek Bids

The filled up condition of English ship yards is bringing inquiries for ocean boats to this side of the Atlantic. One English company is asking quotations on three vessels of 5,000 to 6,000 tons each. Many other prospective ship owners are out for figures, but no new awards have been made.

What the Government is Doing

Rulings of Bureau of Navigation

Hints to Navigators

Custom House Regulations

Inspection Rules to be Changed

THE steamboat inspection service through the office of the supervising inspector general at Washington has distributed a circular showing the proposed amendments to the steamboat inspection laws, of which criticism is invited.

The first change of importance is noted in section 20, rule II, referring to fusible plugs. The proposed rule substitutes a chemical specification for the tin filling in place of the word "Banca". It also changes the requirements for sample plugs, one sample now being required from each heat of 100 plugs or less instead of 50, as formerly. Sample plugs need not be split.

A proposed change which will interest builders and owners alike is included in section 27, rule II. Provision is made for the use of malleable iron for flanges in feed and steam pipes providing the material has a tensile value of not less than 30,000 pounds. It also clarifies the language of the rule by providing that screwed malleable fittings, where used, shall be extra heavy. Provision is further made for the use of screwed flanges of cast iron, semi-steel or ferro-steel having a tensile strength of not less than 20,000 pounds and provided the flanges are made to comply with certain specifications as to construction.

Section 1, rule III, covering boats, rafts, bulkheads and life saving appliances, is modified in respect to motor-propelled lifeboats and engines therefor. This rule also provides for the character of fittings and excludes the space required for motors in fixing the cubical capacity of the boats. The capacity of the air tanks also is to be determined with the weight of motor, fuel, etc., in view.

In section 1, rule III, relating to rivers, exemptions from rules requiring life boats in certain cases are abrogated. In section 9, covering ocean and coastwise shipping, amendments to the requirement for mechanical boat-lowering devices are proposed. Sections 11 and 12, covering ocean and coastwise shipping, 9 and 10 relating to lakes, bays and sounds, and 10 and 11 dealing

with rivers are to be altered. The cubic feet of air space for catamaran life rafts is increased from 3 to 4½ for steamers navigating ocean and coastwise waters. In fixing the carrying capacity of life rafts equivalent buoyancy is accepted in lieu of air space.

Section 16, rivers, will be amended to permit the use of ring buoys in place



NEW AND OLD BRANDYWINE LIGHTS, DELAWARE BAY

of wooden life floats when approved by inspector. Section 1, rule IV, is proposed, fixing the capacity of fire buckets at not less than three gallons each. The capacity of fire buckets and barrels for river steamers are also affected. In section 4, rule VI, the paragraph requiring the examination and drilling of the hull of iron or steel vessels after reaching the age of 15 years is struck out. Section 4, regarding the withdrawal for inspection of outboard shafts, is modified to require outboard shafts of all descriptions to be withdrawn once at least every three years. It is recommended that owners and managers who have not received a copy of this circular write the department asking for circular of April 9, 1915, File No. 1,478.

Alaska Light Station

The light station for Cape St. Elias, Alaska, is to be located on the south end of Kayak island, on a shelf about 50 feet above sea level. According to the plans the tower is square and supports a cast iron watchroom and second-order lantern whose focal plane is 40 feet above the base of the structure and 90 feet above sea level. The illuminating

apparatus consists of a three-mantle lamp in a third-order double-flashing lens of 180,000 candlepower, and the range due to its elevation is 15¼ nautical miles. The metal work for the watch-room and lantern is nearing completion. The fog signal will consist of a 6-inch automatic compressed-air siren, in duplicate, each with a trumpet with a two-way mouth. All this machinery has been ordered and will be exhibited at San Francisco. The construction party started work about May 1. The characteristic of the light is a double white flash every 20 seconds. That of the fog signal is a double blast of four seconds each once every minute.

New Brandywine Light

By Dr. C. S. Street

The new cylindrical concrete light-house, replacing the structure of piling which formerly marked Brandywine Shoals, Delaware bay, is now completed and in charge of Captain Hastings, a well-known light keeper. The superstructure was built on shore, towed to the shoals, and placed upon its foundations of piling by derricks. Its predecessor is now being dismantled. This light ranges with the Fourteen Foot bank light further up the bay, and is the last of those marking the channel. Between it and the open sea are the Harbor Refuge and Breakwater lights and the Overfalls light vessel. The Brandywine light has a 12,000 candlepower white lamp, flashing for 27 seconds with a three-second interval; and a 2,600 candlepower red sector working the shoals east of the channel. The station's third class reed horn gives a four-second blast with a four-second interval. Situated at the south end of the shoal, Brandywine light has a visibility range of 13 miles.

Radio Sets for Lighthouse Service

The radio transmitters and receiving tuners designed for installation on board lighthouse tenders are being supplied to the bureau of lighthouse by the bureau of standards. These equipments have

many new and special features particularly desirable for purposes intended. Equipped with radio, these boats, of which there are several on each coast, will be able to answer distress calls and undoubtedly render much assistance.

June Levels of Lakes

The U. S. lake survey reports the stages of the Great Lakes for the month of June, 1915, as follows:

Lakes.	Feet above mean sea level.
Superior	601.95
Michigan-Huron	579.78
Erie	571.86
Ontario	245.12

Lake Superior is 0.30 foot higher than last month, 0.51 foot lower than a year ago, 0.32 foot below the average stage of June of the last 10 years, 1.48 feet below the high stage of June, 1876, and 0.71 foot above the low stage of June, 1879. Average stages of the last 10 years indicate that the July level will be 0.2 foot higher.

Lakes Michigan-Huron are 0.14 foot higher than last month, 0.82 foot lower than a year ago, 1.20 feet below the average stage of June of the last 10 years, 3.82 feet below the high stage of June, 1886, and 0.12 foot below the low stage of June, 1896. Average stages of the last 10 years indicate that the July level will be 0.1 foot higher.

Lake Erie is 0.17 foot higher than last month, 1.17 feet lower than a year ago, 1.11 feet below the average stage of June of the last 10 years, 2.66 feet below the high stage of June, 1876, and 0.29 foot above the low stage of June, 1895. Average stages of the last 10 years indicate that the July level will be 0.1 foot lower.

Lake Ontario is 0.03 foot lower than last month, 1.79 feet lower than a year ago, 1.92 feet below the average stage of June of the last 10 years, 3.51 feet below the high stage of June, 1870, and 0.23 foot below the low stage of June, 1895. Average stages of the last 10 years indicate that the July level will be 0.1 foot lower.

Dredging at Culebra

Following recent improvements in the slide situation in the Culebra cut, Panama canal, Sunday work has been discontinued. Operations are now carried on daily except Sunday. The 15-yard dipper dredges GAMBOA and PARAISO, the ladder dredge COROZAL, the pipeline suction dredge No. 86, and the seagoing suction dredge CULEBRA are working 24 hours a day, with three shifts; and two of the three smaller dipper dredges, CARDENAS, CHAGRES and MINDI are working 16 hours daily, the third of the dipper dredges being retired in rotation temporarily for re-

pairs. The last delaying obstruction to the channel occurred early in March, prior to which Sunday work had been kept up for about four months. The channel has now a minimum depth of about 30 feet, and minimum width of about 150 feet. The limiting channel is now at the base of Cucaracha slide.

GAMBOA, PARAISO and No. 86 are now working at Cucaracha slide: COROZAL and one small dipper dredge are at the base of the new Culebra slide, and the other small dipper dredge is at the old Culebra slide, on the west bank of the cut.

The big seagoing dredge CULEBRA is ranging between Paraíso and Empire, removing daily about 6,000 cubic yards

of light material which has silted in the channel. Work is suspended at 2:00 p.m. each day to give the right of way to vessels passing through the canal, and resumed immediately after the vessels have passed through the slide section. The vessels in transit are brought to the upper approach wall of Pedro Miguel lock, on the south, or to the passing station opposite Empire, on the north, and moored, prior to 2:00 o'clock; and when the dredging fleet has made way, they are dispatched past the slides quickly. Surveys of the channel opposite the slides are made each day, so that conditions are known to those in charge and the vessels are handled with corresponding accuracy and certainty.

Indians Make Good Sailors

They're "Sober, Sober Men, and Attentive to Their Duty," Quotes Superintendent of Large Lake Fleet

"THE experience of years has convinced me," says W. J. McCormack, superintendent of the Northern Navigation Co.'s lake fleet, "that American Indians make the best sailors. Hard-working, silent men, they take their duties seriously. I have closely observed the red men on the decks of our lake steamers and for days have never seen a sign of mirth among them. They are courteous to passengers, but make no attempts at conversation unless questioned.

"The deck crews on our Lake Superior steamers now consist almost entirely of Indians, most of whom come from the Georgian bay district. Their forefathers for centuries have lived in the lake region; and training and inheritance combine to make them useful men aboard a steamer. Seldom is it necessary to criticize one of them for not performing his duties correctly.

"What is probably the survival of an ancient superstition among these aboriginal tars is the importance they attach to the handling of the bow line. In the olden times when a tribe ventured out on the lakes for a foray, the chief occupied a bow seat in the big canoe; and today they seem to dread a mishap unless one of their race controls the bow line.

"Most of our Indians are less than 21 years of age. We advance them to higher positions as they make good, one red brother having been a successful captain of one of our lake freight steamers for several years. Although they wear the regulation uniform, they retain their trinkets, some of which are heirlooms of centuries. John Rain-in-the-Face has a brass ring which he says his great-great-grandfather re-

ceived from a Frenchman 200 years ago for a big bundle of furs. This ring, worth a few cents, is nearly worn out, yet John regards it as his dearest treasure.

"Again, Nick Fighting Face is proud of the cheap imitation pearl buttons which adorn his coat, and which, he says, were taken from a French countess slain by an ancestor. To see these civil, industrious Indian sailors one can scarcely believe that their forefathers were the warlike and cruel savages of whom we read in history and fiction.

"Apparently they apply the same power of concentration to their peaceful tasks as their progenitors did to the arts of battle and stealth, with the success which usually attends concentration to duty."

Fore River Yard Active

The Fore River Shipbuilding Corporation, Quincy, Mass., is building five large merchant steamers and 14 naval vessels in its yards at the present time. Two oil steamers are being constructed for the Texas Oil Co. They will be 415 feet long and 56 feet beam, with a gross tonnage of 6,500. Two molasses steamers are under construction for the Cuba Distilling Co. Each of these will be 389 feet long and 54½ feet beam, with a gross tonnage of 5,800. A 437-foot cargo steamer also is being built for the Luckenbach Co. The naval vessels under construction at the Fore River yard include the battleship NEVADA, 27,500 tons, the destroyers CUSHING, TUCKER, No. 63 and No. 64, and nine submarines.

In the Traffic Manager's Office

A Review of the Charter Market on Coasts and Lakes—Pointers
for the Men Who Get the Business

Summer Ocean Freight Demand is Light

OCEAN freights tended downward throughout June, the demand falling off in an important degree, especially for nearby tonnage. July tonnage was offered freely. Time chartering requirements seem to have been well supplied and it is believed shippers have obtained about all the tonnage they will need for the remainder of the summer. Coal is active, but this is the only genuinely lively factor of the situation. The call for cotton and grain is very limited, cotton being especially inactive. Deal cargoes have been offered only on a small scale, owing to the congestion at some of the ports of loading, which apparently is due to the rapid movement of war supplies to the coast from interior points.

Various destinations figure in the coal market, but rates have declined during the month. To West Italy they have ranged from 40 to 45 shillings (\$9.60-\$10.80) per ton, the latest offers being of from 40 to 42 shillings (\$9.60-\$10.08); and to the river Plate the range has been from 32 to 34 shillings (\$7.68-\$8.16) per ton, with late offers of from 33 and 36 to 34 shillings (\$7.92-\$8.64 to \$8.16). Rates to Rio Janeiro vary from 36 to 37 shillings (\$8.64-\$8.88) per ton, and to Bahia Blanca from 36 shillings to 37 shillings (\$8.64-\$8.88) at present. The rate to Barcelona is quoted at 36 shillings 6 pence (\$9.24) per ton. The United States government took two steamer loads of coal, one of 3,026 tons to Puget Sound at \$6 per ton, and the other of from 2,000 to 3,000 tons to Tiburon at \$6.35 per ton.

Heavy grain cargoes to French Atlantic ports for June booking were notable early in the month, the rates from the Atlantic range being approximately 9 shillings (\$2.16) per quarter. Orders will be freer in August and September, it is believed.

Some demand for early July shipments to Spanish ports from the Gulf of Mexico, at 9 shillings 3 pence to 9 shillings 6 pence (\$2.22-\$2.28) per quarter, was experienced. For an oats steamer, 8 shillings (\$2.16) per

quarter was paid from the Atlantic range to the west coast of Italy for June loading, and 7 shillings 9 pence (\$1.86) per quarter for July loading. Deal chartering is quiet, 137 shillings 6 pence (\$33) being paid. In special cases, charterers have offered 140 shillings (\$33.60) from the bay of Fundy to the United Kingdom, such demands coming mainly from Canadian ports.

Lumber chartering has been limited. Several cargoes are in prospect for the river Plate, but shippers are reluctant to pay the high rates asked. One at 260 shillings (\$62.40) and another at 265 shillings (\$63.60), for July loading, were noted. From 200 to 210 shillings (\$48-\$50.40) is offered for August loading from the gulf of Mexico to the United Kingdom; and from the gulf of Spain, 230 shillings (\$55.20) was paid. Case oil inquiries are chiefly for August to October loading. A rate of 45 cents per case to China was obtainable during July; and to the river Plate and Brazil, a rate of 40 cents per case was offered. A late offer for September loading from New York to Australia was at 74 cents per case.

Time chartering for transatlantic trips has been quiet. From 15 to 16 shillings (\$3.60-\$3.84) was paid during June for round trips and from 25 to 27 shillings (\$6-\$6.60) for single trips. The demand for trips to the West Indies is from 10 to 11 shillings (\$2.40-\$2.64).

Lake Market Summary

It is predicted that July will see the turn in the tide in lake affairs. W. A. McGonagle, president of the Duluth, Missabe & Northern Railway, predicts that the movement will equal that of 1910, when 42,500,000 tons were moved. The railway has increased its operating force by 50 per cent and expects to move ore at a fast clip during the summer months. Sales of ore are becoming more numerous, though the amounts are relatively small, but it is expected that a good buying movement will set in before the month is over.

Coal is moving in somewhat larger quantities, but the total is well behind that of last year. This circumstance will stiffen the market in the fall, as a definite amount of coal is always required in the northwest. The grain movement has been quiet for the past fortnight and no improvement is looked forward to until harvest.

New Jap Line to Orient

Not content with mastery of the Pacific, the Japanese have invaded the Atlantic and will establish a line of steamers between New York and Oriental ports via the Panama canal. An official announcement of the new service by the Nippon Yusen Kaisha follows:

"The plan is to establish early in August a monthly service from New York and the eastern seaboard of America to Vladivostok, China and Japan, via the Panama canal, with a magnificent fleet of new and fully equipped twin screw steamers of about 10,000 tons dead weight capacity. The steamers are expected to make the voyage from New York to the first port across the Pacific in less than 40 days."

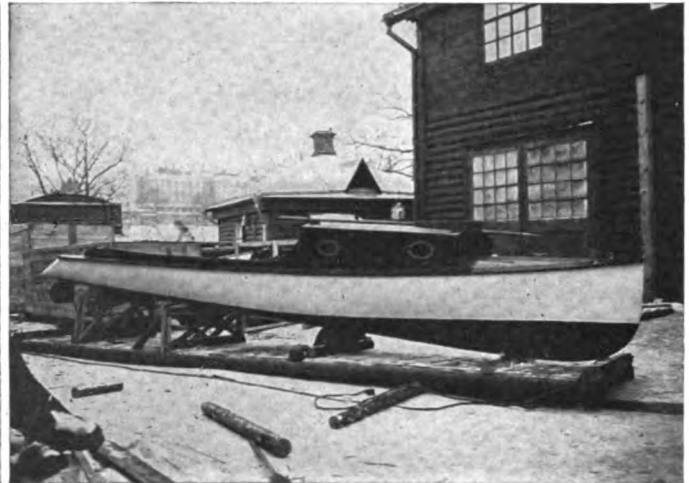
Shipping men heard the announcement of the new Japanese undertaking with much interest. It was especially significant, coming as it does right on top of the decision of the Pacific Mail company to discontinue its oversea service because of the requirements of the new seaman's law. Twelve more steamships are being built for the Japanese company, and if the American service pays they will be used to augment it.

Japanese vessels already have steamed over the course which is to be permanently established. They have carried general cargoes and case oil. It is proposed to continue the service as now established at least until the middle of August and to make it permanent if it develops along profitable lines. The general scheme contemplates a 'round-the-world service with the same steamships going from Japan and China around to London and New York by that course, that also steam through the Panama canal to the Oriental countries.

Power Boats for the Czar's Fleet



Length, 30 feet; beam, 5 feet; draught, 22 inches. Powered by a 4-cylinder, $4\frac{1}{2}$ x 5, Model H, Scripps motor. Speed $15\frac{1}{2}$ knots. Planked in pine on oak frames with mahogany finish. A privately-owned runabout



Length, 30 feet; beam, 5 feet; draught, 22 inches. Powered by a 4-cylinder, $4\frac{1}{2}$ x 5, Model H, Scripps. Speed 10 knots. The hull is of steel with mahogany finish. For the use of the Russian Black Sea fleet

THE accompanying illustrations are of power boats built for service with the Russian Black Sea fleet and are typical of the craft generally used throughout Russia. These photographs were taken as the boats emerged from the shops at Moscow, Russia, preparatory for shipment to the Black sea, where they were put into immediate action. Their exact service has not been divulged, but it is assumed that they are engaged as tenders to the Russian battleships. It is interesting to note that all are equipped with an American-made engine, for each boat carries a Scripps engine.

The photographs were sent to R. V. Warman, secretary and export manager of the Scripps Motor Co., by the Scripps agent at Moscow, and considerable influence was exerted to secure their passage by the censor.

While somewhat odd in appearance, as compared to boats we build in this



Length, 28 feet; beam, $5\frac{1}{4}$ feet; draught, 25 inches. Powered by a 2-cylinder, $5\frac{1}{2}$ x 6 Trans-Atlantic Model L Scripps. Speed, 9 knots.

country, these Russian craft are excellent examples of boat-building art insofar as the structural details are concerned. In every little detail the painstaking care of the slow, but methodical Russian workmen is apparent and there are few, if any, boats built in America which boast a higher finish than has been applied to these craft even though they are meant primarily for war use.

There are also shown photos of two strictly pleasure craft which were built in the same shops. The one, a magnificent mahogany outfit, is the flagship of the Imperial Moscow Yacht Club, being owned by its commodore.

The other boat is merely a typical private-owned runabout, which is seemingly quite speedy, showing a speed of $15\frac{1}{4}$ knots with a 4-cylinder, $4\frac{1}{2}$ x 5-inch Model H Scripps engine operating on kerosene, as, by the way, do all of the Russian craft.



Length, 30 feet; beam, 5 feet; draught, 22 inches. Powered by a 4-cylinder, $4\frac{1}{2}$ x 5, Model H, Scripps. Speed, 12 knots. Planked in pine on oak frames with mahogany finish. For the use of the Russian Black Sea fleet



Length, 30 feet; beam, 5 feet; draught, 22 inches. Powered by a 4-cylinder, $4\frac{1}{2}$ x 5, Model H, Scripps motor. Speed 16 knots. Built of mahogany throughout on oak frames. Flagship of the Imperial Moscow Yacht Club

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

News of the New England Ports

By George S. Hudson

A FIRM stand against the administration's shipping policy has been taken by the Boston chamber of commerce, which in adopting the recommendation of its special merchant marine committee, pronounces in favor of mail and naval auxiliary subsidies as the best solution of the ocean shipping problem. Reaffirming the action of last January, which helped defeat the Wilson-McAdoo government-owned shipping bill, this stand of the Boston chamber, adopted by many other prominent business organizations as well, forecasts a clean-cut issue when the matter of government-owned or government-aided ships is taken up at the next session of congress. Such subsidies as are contemplated by the Boston mercantile organization would tend to even up matters, so that an American bottom trading to Liverpool, Calcutta or Buenos Ayres would be enabled to offer as low a freight rate as a foreign ship and to earn as much profit. Jerome Jones, chairman of the Boston chamber's committee on maritime affairs, says: "The one reform that seems necessary is to adopt subsidy, which foreign governments have been successful in doing. That would offset the higher cost of maintaining American shipping and put this country on a footing with competition. The type of ship in which Boston is particularly interested is the cargo carrier, which might be of service to the government in time of war as colliers, transports, supply ships, etc. As for the steamships equipped to carry mail and passengers, different and large subventions would be necessary."

Two lake-built steel ships, ARLINGTON and BRANDON, have reached the seaboard since spring and are now carrying cargoes of lumber from St. John, N. B., for Newport News, after which they will be operated in the coal trade by the New England Coal & Coke Co., Everett, Mass. The ships were purchased of the Rutland Transportation Co. of Buffalo, and were constructed at Wyandotte, Mich., in 1910, by the Detroit Ship Building Co. General dimensions of ARLINGTON and BRANDON are: Length 244 feet, beam 43 feet, depth of hold 27.2 feet. Their net tonnage is 1,691 tons. The New England Coal & Coke Co. is probably the largest owner of vessels in New England, its holdings including steamers, tugs and barges, with considerable additional tonnage under charter to transport fuel from Louisburg and Sydney, C. B., to the works on the Mystic river, Boston upper harbor. Several of the company's large steamers are now under charter for foreign voyages and, should there be no marked demand for over-sea tonnage, the latest acquisitions will probably be operated between Boston and coal ports.

Sailing vessels of the coal fleet feel the demand for tonnage and have ventured on long voyages. Some are carrying coal to

Argentina and Brazil, others are in the Mediterranean, and a few are headed toward the United Kingdom. The average charter is from \$10,000 to \$15,000 per month. One result of withdrawing the four, five, and six masters from the coal trade is the increased number of tugs that undertake ocean towing. Bay tugs find this employment profitable and generally make fair time from Norfolk or Newport News with a string of three moderate sized barges. During the first 15 days of last month not a pound of coal arrived at Boston in a sailing vessel, a condition without precedent. Yet there is no apparent shortage in fuel and receipts, for the period did not fall far short of the average, thanks to the steamers which deliver some 7,000 tons of soft coal each week, regardless of weather. A half dozen of these powerful colliers are now engaged in the bituminous trade, the bulk of anthracite being transported by barge.

Big money is being earned by the British steamship BOLLINGTON GRANGE, which sailed from Boston recently for Dunkirk, France, with 3,000 tons of beef and 400 tons of provisions. The ship is a refrigerator, and the rate on beef asked by her owners was \$60 per ton, while the provisions stowed in a hold without refrigeration brought \$6,000. The beef came from the west, although a considerable amount of Australian beef is said to be in storage here. Another ship earning large sums is the Norwegian bark ARCADIA, which recently arrived from East London, Africa, with a cargo of 5,800 bales of wool at \$5 per bale. The bark, before her arrival, was chartered to load 1,500,000 feet of lumber at St. John, N. B., for Buenos Ayres, at \$22 per 1,000. This vessel was purchased three years ago for \$18,500, and, figuring the time from East London to Argentina as six months, she will have paid for herself several times over.

Congested conditions at steamship terminals in Liverpool are responsible for Boston-bound ships leaving the Mersey with not more than one-third cargo, that being the case with the Warren line steamship BAY STATE, Captain Trinnick, which arrived recently. She had booked about 3,000 tons of freight and brought less than 1,000 tons, though there was much Boston freight to be moved. But BAY STATE sailed from Boston for Liverpool filled to the coamings.

Demand for cavalry remounts shipped from New England ports to Avonmouth or Liverpool makes it quite easy for the Leyland line to reconcile itself to the fact that eastbound passenger business has practically ceased. The line despatches shiploads of from 900 to 1,100 horses from Boston every week, the rate being about \$40 a head, compared with \$8 or \$9 when the same ships were employed in the cattle business six or eight years ago. The vessels have temporary stalls on deck and, when the war is over, may quickly be re-

stored to passenger service. That the United States is not the only country where rates on horses are abnormally high is shown by Captain Davies of the British steamship HORTENSUS, that arrived at Boston from the river Plate recently. Captain Davies says a fleet of British steamships is transporting horses from Buenos Ayres and Montevideo for the Allies, and that rates are higher than ever before known. The rate on horses is \$62 a head, and some of the ships carry 500 to 600, in addition to large consignments of grain and other cargo.

An addition to the fleet of Boston-owned steamships was launched recently at the yard of the Newport News Ship Building Co. The vessel is WALTER D. NOYES, built for the Crowell & Thurlow Steamship Co., Boston, and intended for the coal-carrying trade between Chesapeake bay and New England ports. NOYES' dimensions are: 375 feet long, 49 feet beam, 30 feet depth of hold, capacity 6,500 tons of coal. She has been chartered for a term of five years to carry coal from Newport News to Boston.

The naval repair ship VESTAL has been laid up at the Boston navy yard for an indefinite period. The VESTAL was formerly a collier. Records for fast passages of steam colliers between Boston and Baltimore were eclipsed recently when the steamer HAMPDEN, Captain A. L. Hersey, of the Coastwise Transportation Co., completed the round trip in five days and three hours. This time included loading 7,509 tons of coal for cargo and 200 tons for bunkers.

Silas W. Owen, baggagemaster of the steamer CITY OF BANGOR of the Eastern Steamship Corporation, recently observed the thirtieth anniversary of his employment in that capacity on the Kennebec route. Officers of the steamer tendered Mr. Owen a complimentary dinner, Herman Johnson acting as toastmaster.

Quantities of rum are being sent from Boston to the west coast of Africa, the latest departure being the four-masted schooner CHARLES WHITTEMORE, Captain Allen. Her cargo will be distributed among seven different ports and includes 666 puncheons, 300 barrels, and 2,000 kegs of rum. The schooner ESTELLE KREIGER is to follow WHITTEMORE with a similar cargo, and the schooner ORLEANS, Captain Rutledge, has arrived at Sekondi with something like 200,000 gallons of the stuff.

The full-rigged ship Avon, Captain Rafuse, made fairly quick time from Buenos Ayres on her first visit to her home port under the American flag with a cargo of 70,000 dry hides and 200 bales of wool. Early in the war Avon, then at Barbadoes, was transferred from British to American registry and proceeded to

St. John, N. B., where she loaded lumber for the river Plate.

The Gardiner G. Deering Co., Bath, Me., has begun work on a five masted schooner closely resembling COURTNEY C. HOUCK, now in the phosphate trade between Florida and Baltimore. Percy & Small will build a four master and a three master is under construction at the yard of F. S. Bowker & Son. Kelley & Spear are building three 2,000 ton coal barges for the trade between Chesapeake bay ports and New England.

Ross A. Perry has been appointed harbor-master at Boston to fill the vacancy caused by the death of Captain F. J. Hird. Captain Perry has been connected with the harbor police about 10 years and now commands the city tug GUARDIAN.

The Norwegian bark LYNTON recently arrived at Boston, 112 days from Antofagasta, Chile, with 3,500 tons of nitrate. She will load lumber at St. John, N. B., probably for the river Plate.

Captain Axel Foss of the coast tug WINNISMET has been transferred to the tug HUDSON at New York. Captain G. B. Robinson of HUDSON comes to Boston as master of WINNISMET.

Boston shipping men believe that before the close of navigation on the Great Lakes many

large steamships will be brought to the coast, owing to the recent decision of the interstate commerce commission, prohibiting ownership of lake steamers by railroads. Some 30 ships are expected to reach salt water by way of the Welland canal and St. Lawrence river, but this number may be decreased, should demand for tonnage become lighter. First of the fleet to forsake the lakes will probably be GEORGE F. BROWNELL, which will leave the dry dock at Buffalo in two bulkheaded sections, which will be rejoined at Quebec. The Western Transit Co. is said to have considered plans for cutting the steamers to permit their passage to the seaboard.

A considerable number of Boston-owned steamers that originated on the lakes are now employed in the foreign trade, apparently with unprecedented profit, judging from the fancy charters. Among them are the steamers SEACONNET, PENOBSCOT, F. S. LISMAN, M. E. HARPER and L. V. STODDARD, managed by the Shawmut Steamship Co.; and GEORGE E. WARREN, operated by the Virginia Transportation Co. These vessels had been running in the coal trade between Chesapeake bay ports and New England. Shortly after war was declared they were withdrawn and chartered at rates not far from \$20,000 per month, though in at least one case the figures were much higher. The ships have capacity for from 2,500 to 5,000 tons of coal. Before being placed in the coast trade, minor alterations were made in the older ships to fit them to the requirements.

advancing. The Nippon Yusen Kaisha, the Osaka Shosen Kaisha and the Toyo Kisen Kaisha have been raising their freight rates on outward cargo, and all rebates previously allowed have been abolished. Rates on raw silk remain unchanged, but those on maize have been advanced from \$4.50 to \$6. The prospective advance on cargo carried on homeward bound vessels, however, has been given up, apparently owing to the objection from cotton importers. Destined to win a three-fold fame as the first fishing vessel to pass through the Panama canal, the first to switch from the Pacific coast to the Atlantic coast, and the first to carry the name of Seattle to the Grand banks of Newfoundland, the halibut schooner VICTOR & ETHAN has left Seattle to be operated in the Atlantic fishing industry by her owners, Captain Herbert Nickerson and the Pacific Net & Twine Co., Seattle.

The service of the volunteer fleet, a Russian government line between Puget sound and Vladivostok, which was recently suspended, is to be resumed at once, with the addition of a number of very large cargo carriers. The full management of the line hereafter is to be entrusted to the Canadian Pacific Railway Co., which will operate the fleet from Vancouver, B. C. Such cargo as originates on Puget sound or is routed via Puget sound cities is to be shipped from Seattle to Vancouver. None of the vessels will load at any port on Puget sound.

The Osaka liner SEATTLE MARU reached Victoria this week with a full cargo of silk, valued at \$500,000. SEATTLE MARU brought word of the launching of the new Osaka liner HAWAII MARU at Kobe on May 19. The new vessel is the largest vessel flying the Osaka flag. She has a gross tonnage of 10,000 and a speed of 17 knots an hour, and will ply between Hongkong and Puget sound.

Ocean trade lanes are slowly adjusting themselves to the exigencies created by the European war, the opening of the Panama canal, and the subsequent development of new trade fields. Within the past six months five new steamship lines have announced their intention of making Portland, Ore., a port of call. One will touch the west coast, two will touch Europe, and two the Atlantic coast.

In the Pacific Northwest

By F. K. Haskell

IF ANY individual or institution is opposed to the ownership of the Great Northern Pacific Steamship Co.'s steamers by the Great Northern and Northern Pacific railroads, he failed to register his appearance at the hearing lately conducted in Portland, Ore., by the interstate commerce commission. On the contrary, shippers from various parts of the Northwest testified to their belief in the value and advantage of this steamship service and characterized as "calamitous" any attempt by the government or other interests to force its discontinuance. The rail officials of the lines concerned testified that the steamship service was necessary for the further development of their own business and the commercial development of the entire northwest. A. R. Mackley, an attorney examiner for the interstate commerce commission, presided at the hearing. J. N. Teal appealed for the Portland chamber of commerce to disprove the supposition that the railroads' ownership of the steamers was detrimental to the public good. Practically every other important city of the Northwest was similarly represented. The two steamers concerned are NORTHERN PACIFIC and GREAT NORTHERN, running between Flavel, Ore., and San Francisco, connecting from Flavel to Portland by special train, and incidentally carrying much of the water travel to the California expositions.

An idea of the importance of the Pacific coast marine trade with Russia may be gained from the fact that during the past three months the Frank Waterhouse Co., Seattle, has sent from Puget sound to Vladivostok six steamers which have carried approximately 60,000 tons of cargo. Two steamers will clear in July, two in August and two in September. These will carry approximately 50,000 tons more. This company now has a fleet of seven steamers engaged in foreign

trade, and more will be added as the trade demands it. Mr. Waterhouse believes that although the new shipping route to Russia was established as a result of the European war, the trade of the United States with the czar's empire via Puget sound will be permanent and that a regular line will undoubtedly be maintained from this port after the war.

Japan's merchant marine is reaping a harvest as a result of the war and freight rates, especially on the transpacific route, have been

New Orleans and the Gulf

By H. H. Dunn

GRIGGS, Cooper & Co., wholesale grocers, St. Paul, Minn., have announced through the New Orleans Association of Commerce that they will establish a steamer line between St. Paul and New Orleans late this fall, to handle the company's imports from the orient through the Panama canal, and from South and Central America.

James E. Flynn has been made U. S. shipping commissioner at New Orleans.

During the heavy storm of July 4, the British tanker TELENA was blown ashore on Algiers point, in the Mississippi river, but was rescued by the tug WILMOT.

Efforts are being made to re-open Red river, in the Louisiana parish of the same name, to navigation, so that the petroleum now being developed in that section may have a water outlet. Shreveport and New Orleans are working on the project and have asked

that government dredges be used to clean out the river, which is in such bad condition that insurance rates on hulls are prohibitive.

More than 8,000,000 feet of lumber is to be marketed this summer from New Orleans in sailing ships. For the first time in 25 years big windjammers are loading with lumber and other cargoes at New Orleans wharves. While steamers are handling cargoes to Europe, sailing vessels appear to have come back into their own. Lumber freight rates, because of demand for ships for the war trade, went to prohibitive heights. The former rate of 22 cents per hundred pounds to Liverpool has leaped to \$1.72, and large cargoes of lumber waiting in New Orleans drew the sailing vessels to this port. The largest sailing ship ever in New Orleans, the Norwegian four-masted barque STOREGUT, is now taking on 2,000,000 feet of lumber. Her carrying capacity is 4,000 tons, dead

weight. The three-master *Mosvol*, of 2,000 tons capacity, also is loading lumber at New Orleans.

The Uruguayan sailing ship *DOMINGO JOAQUIN DA SILVA*, is reported missing. She is out 125 days from Buenos Aires with a cargo of linseed for New York.

The Norwegian barque *ANSA*, which sailed from Mobile, June 4, for Liverpool, with a cargo of timber, went ashore off the Bahama islands, according to advices from underwriters. Her crew of 17 survived.

The Merchants' Transportation Co., just

formed in New Orleans, has purchased the steamer *NATCHEZ*, and will put her in the river trade, under command of Capt. W. A. Duke. Other steamers will be placed in the river trade as fast as conditions warrant. Officers of the company are William T. Hardie, president; John M. Parker, vice president; Charles E. Levy, secretary; David H. March, treasurer, and W. A. Duke, master and manager. Offices have been opened at 830 Gravier street, New Orleans.

The American barkentine *HILDEGAARDE*, 568 tons, Captain Hunter, capsized during a recent squall in Mobile harbor. The barkentine was on the point of sailing for Buenos Aires.

ship Lines, Ltd., which had been in ordinary at Port Huron since June 1, left that port early in July for Ohio ports to load coal for Lake Superior.

A report from Duluth indicates that the grain movement during June suffered a sharp decline, wheat shipments alone being 2,500,000 bushels behind those of June, 1914, a drop of more than 50 per cent. Total grain shipments for June aggregated 2,191,174 bushels, against 4,697,939 bushels in June, 1914.

The Canadian steamer *CARLETON*, owned by Hall & Co., Montreal, was docked at Buffalo early in July for repairs. The steamer struck in the St. Lawrence river recently. When the *CARLETON* leaves drydock she will sail for England.

The high wind which prevailed all day on July 5 is said to have caused a loss of about \$30,000 to Buffalo lake excursion lines. Several excursion vessels operating from Buffalo to neighboring summer resorts were unable to leave dock, the wind blowing steadily at from 55 to 65 miles an hour. Hundreds of persons going to the docks were obliged to turn back.

Fire destroyed the offices and warehouses of the Port Huron & Duluth Steamship Co. at Port Huron, Mich., on July 5. About 15 loaded freight cars were destroyed. The total loss is estimated at \$150,000.

Lieut. G. M. Ravenscroft, who has been in charge of the naval recruiting office in the Cleveland district and the branch hydrographic office in the Federal building, Cleveland, was recently transferred to the U. S. S. *PRAIRIE*. He will be succeeded by Lieut. Zachary Lansdowne of the torpedo boat destroyer *McCALL*.

The steamer *EASTON* recently loaded 2,000 tons of iron ore at Marquette, Mich., for delivery on the coast. This is the first cargo ever shipped from Marquette direct to the coast.

Theodore M. Nipper, Cleveland agent of the Mutual Transit Co., recently resigned his position to become auditor for the Port Huron & Duluth Steamship Co., Port Huron, Mich. Mr. Nippert will be succeeded by Paul H. Diver.

Frank Smith, assistant engineer of the steamer *NYANZA*, died suddenly aboard the steamer on June 30. The body was shipped to North Tonawanda, N. Y.

Work has been started on raising Lightship No. 82, which sank off Point Abino, Lake Erie, in the big storm of November, 1913.

Charles A. McMorris, for many years in the vessel and coal departments of M. A. Hanna & Co., is now associated with R. A. Williams, Rockefeller building, Cleveland.

Jennie Larson of Vassbylund, Sweden, is anxious to locate her brother, Oscar A. G. Peterson, a sailor on the lakes. He was on the steamer *R. L. FRYER* in 1910.

On July 15 the Marquette breakwater light and fog signal was moved about 50 yards from the present end of the breakwater to admit of new construction. The light and fog signal will be operated in the new position without change.

The Maritime Association has passed a resolution urging President Wilson to call a special session of Congress for the purpose of repealing the seamen's bill.

Around the Golden Gate

By A. A. Willoughby

SAN FRANCISCO ship yards have considerable work under way. A motor driven oil barge built by the Union Iron Works for the Union Oil Co. was launched June 26. A new steel two deck tank steamer has also been contracted for by the same company and work is progressing. This steamer will have a length of 435 feet between perpendiculars, a beam of 56 feet, a depth of 33½ feet and a cargo capacity of 70,000 barrels. The hull is being built on the Isherwood system. A speed of 11 knots is called for. Two steel cargo steamers are also under way at the Union Iron Works plant. They were laid down in the new steel slips. One of the boats is being constructed for Hind, Rolph & Co.

The Norwegian steamer *HESPEROS* recently brought in 7,950 tons of nitrate from Antofagasta for one of the California powder works.

The largest cargo of grain carried out of San Francisco by a sailing vessel this year, was taken out by the French boat *VILLE DU MULHOUSE*. There were 88,851 centals of barley valued at \$133,000, shipped by Strauss & Company.

During the month of May, 486 vessels arrived in San Francisco harbor and 507 departed, according to figures issued by the Chamber of Commerce. Coast tonnage amounted to 408,134 tons and foreign to 113,278, incoming; the outgoing tonnage was as follows: coast, 441,204; foreign, 116,542, giving a grand total of 667,555 tons.

Seven steamers are bringing about 25,000 tons of coal from the Atlantic seaboard, for

the United States government. The coal will be discharged at the bunkers at California City, the coaling depot for the Mare Island Navy Yard.

Treasure to the amount of \$135,987 was brought to the Golden Gate from Mexican ports on June 9 by the Pacific Mail boat *CITY OF PARA*.

A new steamship line is announced to begin operations between Philadelphia and San Francisco. It will be known as the Western Navigation Co. The first steamer, *EDISON LIGHT*, is expected to arrive at the western terminus shortly with a general cargo.

Three cargoes of coke and pig iron from Newcastle, England, are bound for San Francisco in sailing vessels. One cargo comes by the way of the Panama canal while the other two take the Horn trip.

The largest cargo for Oriental ports this year was taken out June 12 by the Pacific Mail liner *MONGOLIA*, the cargo being valued at \$1,465,252, exclusive of a large treasure shipment. Edward Russell, second officer of the *MONGOLIA*, is in a local hospital recovering from an attack of appendicitis. He will rejoin the ship on its return.

On the recent interesting items of news in San Francisco shipping circles was the announcement that a Greek steamer would shortly arrive to take on a general cargo for the United Kingdom. The steamer *CONSTANTINOS XII* is the first Greek ship to enter the local harbor in more than 30 years. She is under charter by Balfour, Guthrie & Co.

Up and Down the Lakes

By A. A. Eiben

CAPT. Francis E. Gould, master of the steamer *JUNIOR*, which hit the breakwater at Cleveland and sank May 9, was exonerated from blame for the accident by the local steamboat inspectors at Toledo recently. The inspectors held the parties in charge of the light on the east end of the east breakwater directly responsible for the accident, investigation having shown that a temporary cold blast lantern which had been substituted for the regular light was not burning when the steamer struck. *JUNIOR* was subsequently raised and sold to the Great Lakes Dredge & Dock Co., Chicago.

The Lake Michigan Passenger Line Asso-

ciation, headquarters at Chicago, is fostering a movement to have Congress establish a bureau of marine, which would be supervised by a member of the cabinet.

The steamer *MATOA*, which was wrecked in the great storm of November, 1913, and later salvaged and purchased by the Reid Wrecking Co., Port Huron, Mich., left Port Huron early in July for the coast. She was sold recently to Boston parties and had to be cut into sections to get through the Canadian canal. She will be towed to Quebec by tugs of the Reid fleet.

The steamer *EMPEROR* of the Canada Steam-

Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE Armstrong Cork Co. and the Armstrong Cork & Insulation Co., Pittsburgh, have a joint exhibition of their products in the palace of manufactures at the Panama-Pacific Exposition, San Francisco. These companies state that there is probably no substance in universal use about which there is such a general misconception as cork, and, therefore, their exhibit has been designed more for its educational value than its commercial appeal. The entire cork industry is thoroughly covered and explained and samples of the many different forms of manufactured cork are displayed. Special forms of heat insulating work for covering pipe, boilers, furnaces, etc., also are being shown.

Novel Method of Erecting Docks

A novel method was used in erecting the unloading equipment for James Playfair's new coal dock at Midland, Ontario, one of the largest on Georgian bay. The dock has a frontage of 800 feet and is 300 feet deep. The equipment, furnished by the Cleveland & Erie Machinery Co., Cleveland, consists of two bridges, 180 feet between towers, with an 85-foot cantilever. They carry a 2-ton clam shell bucket and are operated by steam. Instead of erecting the spans for the bridges on false work in their operating position, each one was assembled and riveted on the ground, a special jim-pole being built to raise and place them. One of the spans was swung into position and connected in 45 minutes.

Will Enlarge Plant

Further preliminary steps have been taken toward the extensive enlargement of the ship yard of the Samuel L. Moore & Sons Corporation, Elizabethport, N. J., a subsidiary of the Bethlehem Steel Corporation, plans for which recently were first announced. The city authorities have complied with a request of the company to vacate certain streets in order that the plant extensions may be carried out. The work to be done involves the ship yard formerly owned by the Crescent Shipyard Corporation, which was taken over by the Bethlehem Steel Co. in 1905 and two years later was placed under the

control of the Samuel L. Moore & Sons Corporation, a subsidiary. The capacity of this plant is to be so extended that large-size vessels may be constructed. One statement is that the enlarged plant will employ more than 1,000 men.

Boiler Graphite

The S. Obermayer Co., Chicago, has issued a 4-page pamphlet on boiler graphite under the title "An Ounce of Prevention is Worth a Pound of Cure."

The boiler graphite manufactured by this concern is described and suggestions for its use are offered. The pamphlet states that the graphite is non-corrosive and is not acted upon by acids or alkalis. It is said to be a pure amorphous material, free from oil, and tests have indicated that it prevents the formation of scale. It is suggested that a mixture consisting of graphite, boiled linseed or carbon oil and a small quantity of litharge will give satisfactory results.

Oldest Salesman

Arthur K. Ingraham, 78 years old and for 45 years a salesman for the Joseph Dixon Crucible Co., Jersey City, N. J., has received a letter from "Uncle George" Olney, in which the latter relinquished to Mr. Ingraham the title of dean of traveling salesmen. Mr. Olney, who is 80 years old, has retired from active service with the Irving Pitt Mfg. Co., Brooklyn, N. Y. Mr. Ingraham and Mr. Olney together have served more than a century as salesmen.

Trade Notes

The Terry Steam Turbine Co. has opened an office in the Michigan Trust building at Grand Rapids, Mich., in charge of A. L. Searles.

Andrew Fletcher has been elected a director of the William Cramp & Sons Ship & Engine Building Co.

C. H. Pearson, 29 Broadway, New York, announces that the corporation of C. H. Pearson Co. has been dissolved and that the business of importer and dealer of all kinds of hard woods is being carried on by him personally.

The Nordberg Mfg. Co., Milwaukee,

announces that E. W. Swartwout, formerly of the Chicago office, will be associated after June 1 with Mr. MacLaren in the New York office of the company. Enlarged offices have recently been taken in the Equitable building, 120 Broadway, New York. The Chicago office will be in charge of John E. Lord.

Earl F. Scott, 702 Candler building, Atlanta, Ga., has been appointed Georgia representative of the Terry Steam Turbine Co.

K. E. Kersten has been appointed branch manager of the Boston Belting Co., 84 Linden Park street, Boston. Mr. Kersten's headquarters will be at 172 West Randolph street, Chicago, Ill.

Eckliff boiler circulators are being installed in the fourteen boilers of the six new ships now being built at the yard of the New York Shipbuilding Co., Camden, N. J., for the Coastwise Transportation Co., of Boston. Two of these ships have three boilers each and four ships have two boilers each.

The Pittsburgh office of the Terry Steam Turbine Co. is located at 1624 Ohio building, in charge of H. A. Rapelye.

H. R. Spencer announces that he has formed a partnership for the practice of law with his son, R. W. Spencer, under the firm name of Spencer & Spencer, with offices in the Alworth Bldg., Duluth, Minn. The firm will give special attention to marine law.

The Chicago office of the Terry Steam Turbine Co. is now located in the Peoples Gas building and is in charge of A. L. Searles.

Engberg's Electric & Mechanical Works, St. Joseph, Mich., has issued an interesting 16-page booklet describing its self-contained, steam-driven, electric generating sets, which are particularly suitable for installation on shipboard. These sets include a vertical engine of an improved type, fitted with a balanced piston valve and a multipolar generator, compound wound, for 115 volts.

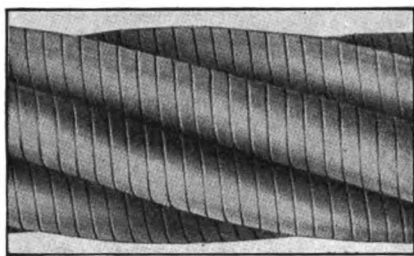
The June issue of the *Penberthy Engineer & Fireman*, published by the Penberthy Injector Co., Detroit, contains a reprint of an interesting paper on the "Behavior of Riveted Joints under Stresses," read before the Society of Naval Architects and Marine Engineers, by James E. Howard in December, 1914.

Equipment Used Afloat and Ashore

Interesting Details of New Devices—Armored Rope—Hollow Staybolts
—Improved Boiler—Fire Bucket Tanks—Water Cooler—Hose Coupling

THE Waterbury Co., New York City, has developed a new type of rope, said to be particularly suitable for marine service. In order to increase its wear-resisting qualities, the rope is armored, each strand being wound with a flat wheel wire having convex edges. The flat wire forms a loom, in which the rope strands are encased and protected. This is said to relieve the tensile strength wires of all abrasive wear and the rope, therefore, retains its original strength until after the flat wires have been completely worn through. The Waterbury armored rope is said to be particularly suitable for hoisting purposes or for use under other conditions where the wear is severe.

The Waterbury Co. also manufactures a special form of wire rope, in which each strand is served with tarred Russian hemp marline. It is said that this



ARMORED ROPE SERVED WITH
FLAT WIRE

fiber prevents the wire strands from chafing and wearing, due to flexing movements, and that after a short time the fiber covering packs into the interstices of the strands, resulting in a rope with a smooth cylindrical surface, particularly suitable for life boat falls and other purposes where a rope combining extreme flexibility and strength is required.

Hollow Staybolts

The Falls Hollow Staybolt Co., Cuyahoga Falls, O., has developed a staybolt particularly suitable for marine boilers. In the process of manufacture a tell-tale hole is rolled throughout the entire length of the bolt and if the bolt is fractured water immediately commences to leak through this hole. The federal boiler inspection law requires a $\frac{1}{8}$ -inch hole in all rigid stays and the permanent tell-tale hole in the Falls staybolt fully complies with this provision. Also, by using hollow staybolts

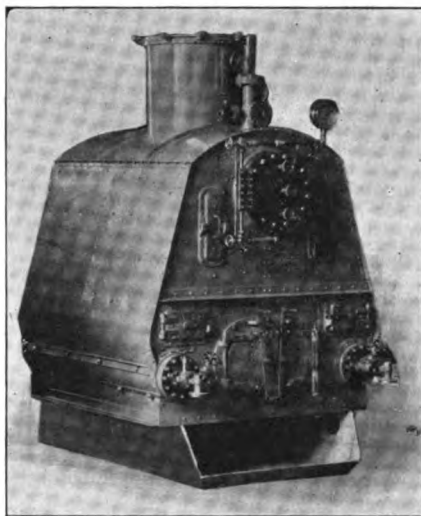


FIG. 1—EXTERIOR OF HIGH PRESSURE
WATERTUBE BOILER

the expense and inconvenience attendant on drilling tell-tale holes is avoided. The Falls Hollow Staybolt Co. also manufactures solid bolts, both the hollow and solid types being rolled from double refined charcoal iron.

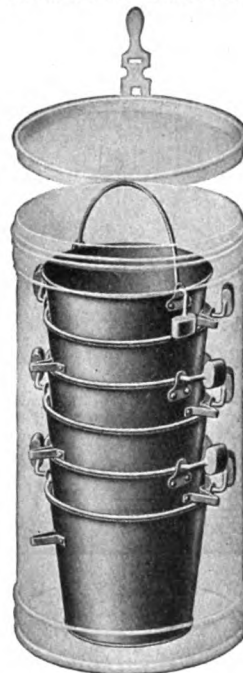
Improved Boiler

The Charles L. Seabury & Co., Morris Heights, New York City, recently delivered eight water-tube boilers of a new type to the United States navy department. These boilers also are suitable for high speed passenger steamers or for steam yachts. They



FIG. 2—BOILER WITH ITS CASING
REMOVED SHOWING ARRANGEMENT OF TUBES

are shown in the accompanying illustrations and are designed to operate with 165 pounds steam pressure. They were tested with 500 pounds hydrostatic pressure by the builders. Including the casing, the overall dimensions of each boiler are as follows: Length, 4 feet $3\frac{1}{2}$ inches; width, 4 feet 4 inches; height, 5 feet $6\frac{1}{2}$ inches. Approximately 240 square feet of heating surface and $12\frac{1}{2}$ square feet of grate surface are provided. The upper or steam drums are made of 15-inch lap-welded steel pipe, $\frac{1}{2}$ -inch in thickness. The lower or mud drums are of



NEW FIRE BUCKET OUTFIT

the same material $8\frac{1}{2}$ inches outside diameter and $\frac{5}{16}$ -inch thick. The generating tubes are 1 inch No. 12 Birmingham wire gage seamless drawn steel, bent to shape. Complete with fittings, each boiler weighs 3,800 pounds.

Fire Bucket Tanks

Fire bucket tanks of new design recently have been put out by the Wheeling Corrugating Co., Wheeling, Va. The tanks are made in two sizes, holding 21 and 31 gallons respectively, of a non-freezing solution or water. Six nested buckets with self raising bail, are submerged in liquid in these tanks.

The top bucket is always filled and ready for instant service. When this bucket is removed, the next bucket

fills and the handle automatically raises. The buckets, it is claimed, cannot stick or bind as they are held apart by strong lugs. After all of the buckets have been removed a reserve supply of the liquid remains in the tank and can be dipped out.

These tanks occupy a floor space of 18½-inch diameter for the large size, and 15½-inch diameter for the small size. The buckets used in the small tank are of 10-quart capacity and in the large tank, 14-quart capacity.

Owing to the simplicity of construction, the small floor space required and the absence of maintenance charges, these tanks are said to be especially adapted for ship fire use.



WATER COOLER FOR USE ON SHIPBOARD

Sanitary Water Cooler

L. G. Stebbins, New London, Conn., has developed a sanitary water cooler particularly adapted for service on shipboard. The ice is placed in a separate compartment in the top with the drinking water underneath. The water melted from the ice runs down through a pipe into a false bottom from which it is drawn off as necessary. The ice chamber is surrounded by an air tight compartment which prevents melting losses. The cooler is built of heavy sheet metal suitably enameled and is fitted with two faucets, one for draining off drinking water and the other for removing the water melted from the ice.

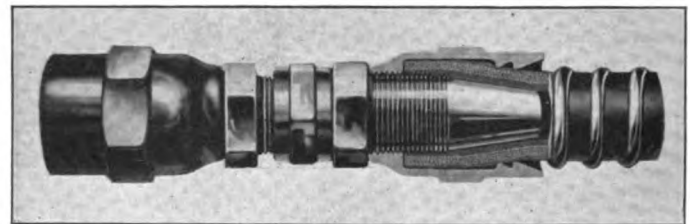
The Chicago Pneumatic Tool Co., Fisher building, Chicago, has just put out a pamphlet descriptive of its Uni-

versal electric drills operating on direct or alternating current. The pamphlet contains complete descriptions and will be mailed to anyone interested upon request.

New Hose Coupling

A new coupling is being manufactured by the National Hose Coupling Co., Peoples Gas building, Chicago, for use on hose carrying compressed air, steam or water, and may be attached, it is said, without clamps, straps or special fastening tools. The sockets are malleable, all other parts being steel.

The socket is corrugated internally, as shown in the accompanying illustration, providing a positive grip when the hose is expanded, the steel taper expander forcing the hose outward into position as it is screwed into place. The hose enters the socket readily and may be cut and recoupled as often as required. Absence of projections on the exterior prevents catching on sharp corners as the hose is dragged along the floor or over material. No attempt is made to contract the outside of the hose, all stress being applied from the inside. The edge of the socket and end of the expander are rounded to prevent injury to the hose, no special attachments being required. The internal diameter of the hose is not narrowed by the device. The coupling is designed for use in ship yards, foundries and steam plants.



NEW HOSE COUPLING FOR SHIP YARDS

Hoist of New Type

The Standardizing Machinery Co., 78-80 Broad street, New York, recently put on the market the Ernst hoist and elevator for handling ashes from the boiler room floor as well as handling loads from hatchway to deck. The Ernst hoist is made entirely of metal and the complete equipment, including cables and pulley, is furnished with each hoist. The up-rights are made of 5-inch channel iron, into which the hoist proper slides, and the hoist is made of two 1½ x 2-inch angles stiffened and riveted together, while the bottom is 7-inch channel. To operate the hoist, the handle is turned until the hoist reaches the desired height, when the automatic clutch springs out and holds the hoist. By turning the crank, merchandise may be quickly transported from hatchway to deck or vice versa. The hoist is equipped with brakes for

both lowering the arm and the load and is made in 400 to 700 pounds capacity. For handling ashes from the boiler floor to the deck, the Ernst type of elevator is an excellent device. The elevator consists of a 2½-inch pipe extending from boiler room floor to deck, upon which a carrier rides up and down, operated by a handle on drum winding. The elevator will raise loads up to 300 pounds and is provided with two speeds for hoisting either light or heavy loads, as well as a brake permitting the load to be lowered with ease and without the use of a crank handle.

Well Known Shipwright Dies

Robert Campbell, known in Great Lakes and New England coast ship yards, died June 24 at his home in Wilmington, Del., of Bright's disease, age 64 years. He was a native of Glasgow, Scotland, served his shipwright appren-

ticeship there, and came to this country at 21, entering the employ of the John Roach Shipbuilding Co., Chester, Pa. He afterwards became superintendent of the Buffalo Iron Works, the Craig Shipbuilding Co., F. W. Wheeler Shipbuilding Co., and the Chicago Shipbuilding Co.

Mr. Campbell placed the first piece of armor on an American battleship, the old monitor Miantonomah, built at the Roach yards. He was the originator of several methods in use today in steel ship hull construction. He was recently employed by the Maryland Steel Co., Sparrows Point, Md., and the Harlan & Hollingsworth Corporation, Wilmington, Del.

Sealed proposals will be received at the office of the United States engineer, Custom House, Norfolk, Va., until noon Aug. 4, for dredging in the inland waterway from Norfolk, Va. to Beaufort, N. C.

The conveyor steamer building at Lorain for the Limestone Transportation Co., and intended to engage in the stone trade at Calcite, Mich., will be named W. F. WHITE.